NASA SP-7011 (134)

(NASA-SP-7011(134)) AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 134) (NASA) 92 p HC $4.00 CSCL 06E

N75-16210

Unclas

00/52 08536

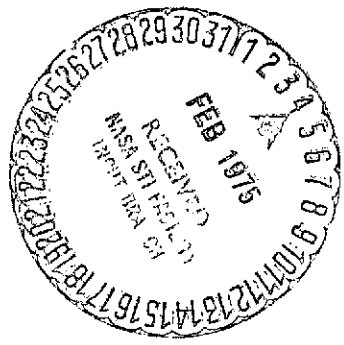
AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY

WITH INDEXES

(Supplement 134)

NOVEMBER 1974



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

STAR (N-10000 Series)	N74-29367—N74-31412
IAA (A-10000 Series)	A74-38031—A74-40958

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

The Administrator of the National Aeronautics and Space Administration has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Agency. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through July 1, 1974.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA SP-7011 (134)		

4. Title and Subtitle	5. Report Date
AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 134)	November 1974
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
	10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D.C. 20546	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This special bibliography lists 301 reports, articles, and other documents introduced into the NASA scientific and technical information system in October 1974.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Aerospace Medicine Bibliographies Biological Effects	Unclassified - Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	94	$4.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22151

NASA SP-7011 (134)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 134)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in October 1974 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

Scientific and Technical Information Office
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NOVEMBER 1974
Washington, D.C.

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22151 for $4.00. For copies mailed to addresses outside the United States, add $2.50 per copy for handling and postage.

INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 301 reports, articles and other documents announced during October 1974 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Reports (IAA)*. The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes—subject and personal author—are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1974 Supplements.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A74-10000 series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies are available at $5.00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche [1] are available at the rate of $1.50 per microfiche for documents identified by the # symbol following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum airmail postage to foreign countries is $1.00. Please refer to the accession number, e.g., A74-10763, when requesting publications.

STAR ENTRIES (N74-10000 Series)

A source from which a publication abstracted in this Section is available to the public is ordinarily given on the last line of the citation, e.g., Avail: NTIS. The following are the most commonly indicated sources (full addresses of these organizations are listed at the end of this introduction):

Avail: NTIS. Sold by the National Technical Information Service at the price shown in the citation. If no price is shown in a current *STAR* citation, it may be ascertained by referring to *Government Reports Announcements* or to NTIS. Beginning with documents announced in Issue 21, 1973, "stocked" reports, such as printed NASA reports are priced on a step schedule ranging irregularly from **$3.00** for a 1-to-25 page report to **$11.00** for 576 to 600 pages, plus $2.00 for each additional 100-page increment. Demand print reports (those for which a facsimile reproduction will be made to fill orders) are priced at **$4.00** for the first 20 pages plus 25 cents for each five pages or portions thereof. These prices are not applied retroactively; i.e., reports previously announced at a certain price continue to be sold at that price. If "Avail: NTIS" without a price appeared in the citation of a NASA report (asterisked) it is sold at $3.00 whether printed copy or facsimile is supplied. Because of price changes and possible surcharges, it is recommended that for any document announced in *STAR* before July 1970, NTIS be queried as to the price. Document prices are subject to change without notice. See "Avail: SOD" below for documents available from both the Superintendent of Documents and NTIS.

Microfiche. Microfiche is available from NTIS at a standard price of $2.25 (regardless of age) for those documents identified by the # sign following the accession number (e.g., N74-10108#) and having an NTIS availability shown in the citation. Standing orders for microfiche of (1) the full collection of NTIS-available documents announced in *STAR* with the # symbol, (2) NASA reports only (identified by an asterisk (*)), (3) NASA-accessioned non-NASA reports only (for those who wish to maintain an integrated microfiche file of aerospace documents by the "N" accession number), or (4) any of these classes within one or more *STAR* categories, also may be placed with NTIS at greatly reduced prices per title (e.g., 45 cents) over individual requests. Inquiries concerning NTIS Selective Research in Microfiche should be addressed to the Subscription Unit, National Technical Information Service.

Deposit Accounts and Customers Outside U.S. NTIS encourages its customers to open deposit accounts to facilitate the purchase of its documents now that prices vary so greatly.

NTIS customers outside the United States are reminded that they should add the following handling and postage charges to the standard or announced prices:

(1) A microfiche is a transparent sheet of film, 105 x 148 mm in size, containing up to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

hard (paper) copy, $2.50 each document; microfiche, $1.50 each document. For subscribers outside the United States who receive microfiche through the Selective Research in Microfiche program, NTIS will add 15 cents for each title shipped.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The price is given following the availability line. (An order received by NTIS for one of these documents will be filled at the SOD price if hard copy is requested. NTIS will also fill microfiche requests, at the standard $2.25 price, for those documents identified by a # symbol.)

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the Mississippi Test Facility, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: NASA Scientific and Technical Information Office. Documents with this availability are usually news releases or informational brochures available without charge in paper copy.

Avail: AEC Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of U.S. Atomic Energy Commission reports, usually in microfiche form, are listed in *Nuclear Science Abstracts*. Services available from the USAEC and its depositories are described in a booklet, *Science Information Available from the Atomic Energy Commission* (TID-4550), which may be obtained without charge from the USAEC Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts*, and are sold by University Microfilms as xerographic copy (HC) at $10.00 each and microfilm at $4.00 each, regardless of the length of the manuscript. Handling and shipping charges are additional. All requests should cite the author and the Order Number as they appear in the citation.

Avail: HMSO Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc., (PHI), Redwood City, California. The U.S. price (including a service charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown (If none is given, inquiry should be addressed to BLL).

Avail: ZLDI Sold by the Zentralstelle für Luftfahrtdokumentation und -Information, Munich, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability: Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent Office. Sold by Commissioner of Patents, U.S. Patent Office, at the standard price of $.50 each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the monthly supplements, excluding the annual cumulative index, is $18.75 domestic; $23.50 foreign. All questions relating to the subscriptions should be referred to NTIS.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics
Technical Information Service
750 Third Ave
New York, N.Y. 10017

British Lending Library Division
Boston Spa, Wetherby,
Yorkshire, England

Commissioner of Patents
U.S. Patent Office
Washington, D.C. 20231

ESRO/ELDO Space Documentation Service
European Space Research Organization
114, av. Charles de Gaulle
92-Neuilly-sur-Seine, France

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information Facility
P.O. Box 33
College Park, Maryland 20740

National Aeronautics and Space Administration
Scientific and Technical Information Office (KSI)
Washington, D.C. 20546

National Technical Information Service
Springfield, Virginia 22151

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Atomic Energy Commission
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

Zentralstelle für Luftfahrtdokumentation und -Information
8 München 86
Postfach 880
Federal Republic of Germany

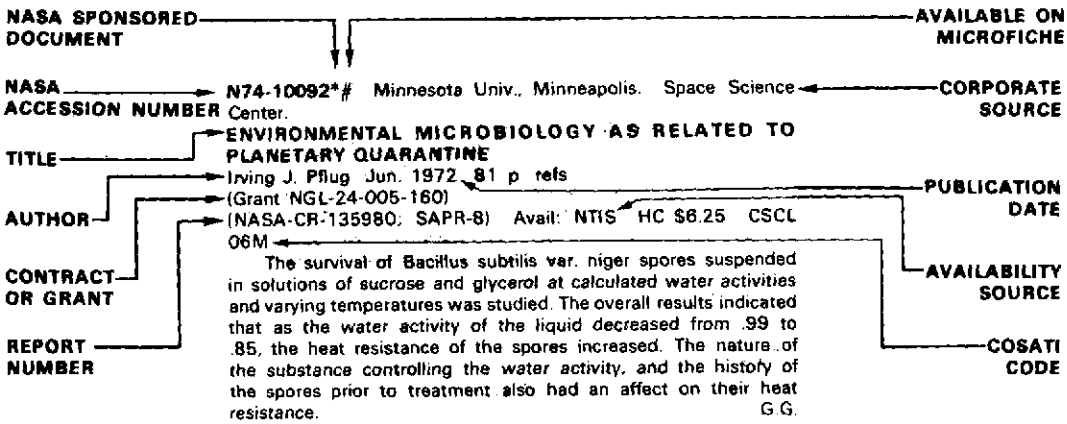
TABLE OF CONTENTS

Page

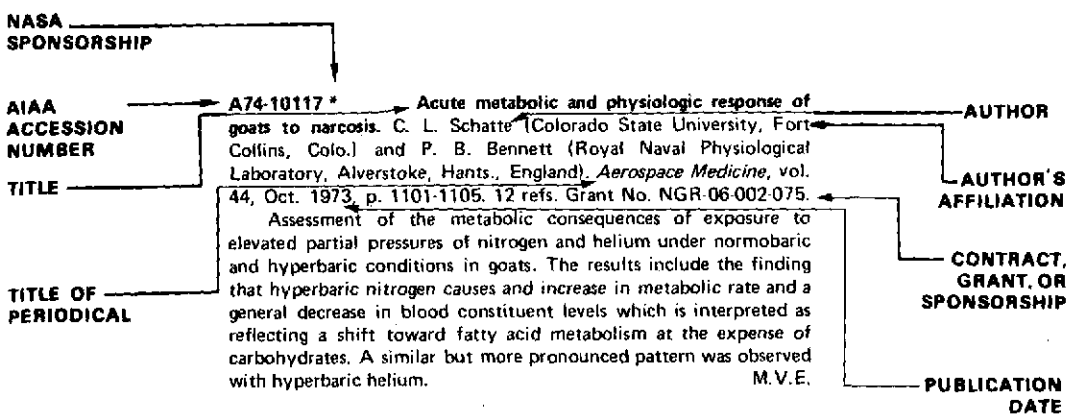
IAA Entries (A74-10000) 329
STAR Entries (N74-10000) 355

Subject Index I-1
Personal Author Index I-31

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 134) NOVEMBER 1974

IAA ENTRIES

A74-38048 // **Outline of experimental aeromicrobiology (Ocherki eksperimental'noi aeromikrobiologii).** S. S. Rechmenskii. Moscow, Izdatel'stvo Meditsina, 1973. 164 p. 226 refs. In Russian.

An outline of developments in the new science of aeromicrobiology, the study of bacterial and viral aerosols, containing unpublished material drawn from the author's own research. These experimental and theoretical studies constitute the scientific basis for the development of effective measures to combat a large group of aerogenic infections. The techniques for studying bioaerodispersive systems and their biophysical properties are discussed, and procedures for modeling aerogenic infections in animals and human volunteers to determine pathogenesis, immunogenesis, and the transmission of irritants are described. Details of the experimental equipment are given, and some complex apparatus for modeling bioaerodispersive systems and measuring the reaction of their biological components to physical stresses is described. An exhaustive bibliography is included. J.K.K.

A74-38080 **Induced stereomovement.** C. W. Tyler (Bristol, University, Bristol, England). *Vision Research*, vol. 14, Aug. 1974, p. 609-613. 14 refs. Research supported by the Foundations Fund for Research in Psychiatry.

Temporal limitations of three-dimensional shape constancy were investigated by measurement of the perception of movement in an oscillating random-dot stereogram. The departure from shape constancy produced by this stimulus induces apparent movement in the stereoscopic figure. This induced stereomovement is best perceived at low oscillation frequencies. Perception of induced stereomovement differs from perception of monocular movement or previously observed types of stereomovement. (Author)

A74-38081 **Sensitization by annular surrounds - Sensitization and the contrast-flash effect.** K. R. Alexander (Rochester, University, Rochester, N.Y.). *Vision Research*, vol. 14, Aug. 1974, p. 623-631. 17 refs. Grant No. NIH-00421.

In spatial sensitization, the onset of a sensitizing annulus lowers the threshold for a test probe presented concentric with a continuously illuminated disk which fills the center of the annulus. In the contrast-flash effect, the onset of an annulus elevates the threshold for a test stimulus which fills the center of the annulus. In the present study, stimulus parameters which differ between the two paradigms were systematically altered in order to converge on a stimulus configuration in which the annulus would either elevate or lower the threshold for a test stimulus with a change in only one or two of the stimulus values. It was found that the variables critical in determining the effect of an annulus on the threshold are the presence or absence of a steady disk at the center of the annulus, and for one subject the size of the test stimulus. (Author)

A74-38082 **Temporal tolerance of the foveal size of Panum's area.** G. C. S. Woo (Waterloo, University, Waterloo, Ontario, Canada). *Vision Research*, vol. 14, Aug. 1974, p. 633-635. 9 refs.

The critical delay time between two stimuli of 10-msec exposure time without affecting the size of Panum's area is found to be between 30 and 40 msec. It is suggested that the reduction in size beyond the critical delay time may be due to the detection of a misalignment of the test targets based on temporal factors. Thus, in terms of Panum's area, it may be said that, in addition to a spatial tolerance, there is also a temporal tolerance. (Author)

A74-38083 **The ocular dipole - A damped oscillator stimulated by the speed of change in illumination.** R. Täumer, J. Hennig, and D. Piernice (Freiburg, Universität, Freiburg im Breisgau, West Germany). *Vision Research*, vol. 14, Aug. 1974, p. 637-645. 18 refs. Deutsche Forschungsgemeinschaft Grant No. SFB-70.

The long-lasting variation of the electrical ocular dipole moment (ODM) subsequent to a luminance step is a damped oscillation. The amplitude of the oscillation depends on the luminance difference not only at light steps but also at steps to darkness. At stimulation of the system with an exponential sinusoidal light and a period time like the eigenfrequency the amplitude shows a resonance maximum. Resonance also occurs on excitation with steps of luminance. The input of the system is sensitive to the rate of luminance change. Slow increasing luminance does not excite an oscillation. If two luminance steps stimulate the system the waves following each step are summated to the resulting oscillation. F.R.L.

A74-38084 **Spectral sensitivity of the modulation-sensitive mechanism of vision.** L. E. Marks (John B. Pierce Foundation Laboratory; Yale University, New Haven, Conn.) and M. H. Bornstein (Yale University, New Haven, Conn.). *Vision Research*, vol. 14, Aug. 1974, p. 665-669. 6 refs. Grant No. AF-AFOSR-70-1950.

Spectral sensitivities were measured by a procedure of flicker threshold. The shape of the spectral sensitivity curve depends systematically on both the frequency and percentage of temporal modulation. The variations in spectral sensitivity are consistent with two different sets of deLange characteristics - one set applicable to short and medium wavelengths, the second applicable to long wavelengths. (Author)

A74-38085 **Dark adaptation of separate cone systems studied with psychophysics and electroretinography.** D. V. Norren and P. Padmos (Instituut voor Zintuigfysiologie RVO-TNO, Soesterberg, Netherlands). *Vision Research*, vol. 14, Aug. 1974, p. 677-686. 26 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wettenschappelijk Onderzoek.

A74-38086 **Binocular rivalry suppression - Insensitive to spatial frequency and orientation change.** R. Blake and R. Fox (Vanderbilt University, Nashville, Tenn.). *Vision Research*, vol. 14, Aug. 1974, p. 687-692. 7 refs. Grant No. NIH-EY-00590.

The selectivity of rivalry suppression, defined as sensitivity to new information presented during suppression, was measured by determining the detectability of changes in the suppressed rivalry stimulus. The stimulus was a vertical grating whose spatial frequency or orientation could be changed without altering contrast or mean luminance. Large changes in frequency and orientation were not detectable. Increments in contrast were detectable, but not decrements. Suppression is fundamentally nonselective, remaining insensitive to all classes of stimulus change except those constituting an energy increment. (Author)

A74-38087 **Direction perception and human fixation eye movements.** J. M. Findlay (Durham, University, Durham, England). *Vision Research*, vol. 14, Aug. 1974, p. 703-711. 27 refs.

The investigation reported includes an experiment in which the accuracy of the perception of direction was studied. This experiment provides basic information required for a second experiment in which eye movements were recorded. The results obtained in the first experiment appear to be in agreement with those reported by Matin (1972). The second experiment demonstrates that judgments of visual direction during fixation microsaccades show a systematic pattern of errors. G.R.

A74-38088 **Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves.** P. Whittle and M. T. Swanston (Cambridge University, Cambridge, England). *Vision Research*, vol. 14, Aug. 1974, p. 713-719. 19 refs. Research supported by the Medical Research Council.

The difference threshold considered in the investigation reported involves the discrimination between two changes. The subject saw two flashes, simultaneous but with a gap between them, one on either side of a fixation point. The subject had to say which of the two flashes had the greater luminance. The results of the tests confirm relations obtained by Cornsweet and Pinsker (1965). It was found that Weber's law is approximately obeyed from the detection threshold up to the highest luminances used. G.R.

A74-38089 **On interocular transfer of various visual after-effects in normal and stereoblind observers.** C. Ware and D. E. Mitchell (Dalhousie University, Halifax, Canada). *Vision Research*, vol. 14, Aug. 1974, p. 731-734. 24 refs. National Research Council Grant No. APA-7660; Medical Research Council of Canada Grant No. MA-5027.

A74-38090 **The spatial selectivity of the tilt aftereffect.** C. Ware and D. E. Mitchell (Dalhousie University, Halifax, Canada). *Vision Research*, vol. 14, Aug. 1974, p. 735-737. 8 refs. Defence Research Board of Canada Grant No. 9401-58; National Research Council of Canada; Grant No. APA-7660.

One of the three aftereffects that follow prolonged inspection of a grating, namely the tilt aftereffect, is reinvestigated with respect to its spatial tuning, using a method that removes some of the objections that can be leveled against earlier measurements. The obtained results indicate that the spatial tuning of the tilt aftereffect is similar to that exhibited by the two other aftereffects, i.e., the spatial frequency shift reported by Blakemore et al. (1970) and the threshold elevation effect described by Blakemore and Campbell (1969). M.V.E.

A74-38120 **Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under.** J. E. Davia, M. D. Cheitlin (U.S. Army, Walter Reed Army Medical Center, Washington, D.C.), F. J. Hallal (Georgetown University Hospital, Washington, D.C.), G. Gregoratos (U.S. Army, Letterman General Hospital, San Francisco, Calif.), R. McCarty, and W. Foote (William Beaumont General Hospital, El Paso, Tex.). *American Heart Journal*, vol. 87, June 1974, p. 689-696. 35 refs.

Coronary arteriography was performed in 60 patients aged 35 or less with suggested coronary artery disease. Twenty patients (group I) had normal coronary arteries and 40 patients (group II) had one or more obstructive lesions. Single-vessel disease was found in 60% of the patients, an incidence that is considerably higher than in studies of older patients. The incidence of the following clinical features were not significantly different in groups I and II: typical angina, atypical angina, positive family history, smoking, hypertension, obesity, abnormal electrocardiogram, positive treadmill test, HLP, and diabetes mellitus. Since almost all of the previously reported cases of myocardial infarction with normal coronary arteries have occurred in young patients, history of a myocardial infarction does not assure the presence of obstructive coronary artery lesions. It is suggested that coronary arteriography is a justifiable procedure in a young patient who presents a clinical picture either compatible with or not clearly distinguishable from coronary arterial disease. P.T.H.

A74-38121 **Evaluation of isoproterenol as a method of stress testing.** D. T. Combs (U.S. Army, Letterman Army Medical Center, San Francisco, Calif.) and C. M. Martin (U.S. Army, Madigan Army Medical Center, Tacoma, Wash.). *American Heart Journal*, vol. 87, June 1974, p. 711-715. 17 refs.

The isoproterenol stress test was administered to thirty-five patients undergoing diagnostic coronary arteriography in order to compare its specificity and sensitivity to that of a standard treadmill exercise test. It was comparable to the treadmill test in predicting the presence or absence of coronary artery disease (71% correct predictions with isoproterenol test vs 68% correct with treadmill test), and it was administered safely and easily. The isopreterenol test had several advantages. The baseline is stable and the intraprocedure ECG can be more easily monitored; the test can be applied in situations where exercise is impossible; other monitoring such as phonocardiograms, blood pressure, etc., can be easily obtained. P.T.H.

A74-38122 **Coronary artery occlusion and blood lipids.** J. J. Barboriak, A. A. Rimm, A. J. Anderson, F. E. Tristani, J. A. Walker, and R. J. Flemma (Wood Veterans Administration Center, Wood; Wisconsin, Medical College; St. Luke's Hospital, Milwaukee, Wis.). *American Heart Journal*, vol. 87, June 1974, p. 716-721. 23 refs. Grant No. NIH-HL-14378.

The correlation between angiographically ascertained plasma cholesterol and plasma triglyceride levels and coronary obstruction was studied in 481 patients undergoing diagnostic arteriography. In older patients, a pronounced coronary occlusion was frequently found at cholesterol levels considered normal for that age; in younger patients, extensive occlusive disease was mainly seen in the presence of elevated cholesterol levels. Correlation between triglyceride levels and coronary occlusion seemed less pronounced. P.T.H.

A74-38123 **Epidemiology of coronary heart disease among young Army males of World War II.** Z. Hrubec (National Academy of Sciences - National Research Council, Medical Follow-up Agency, Washington, D.C.) and W. J. Zukel (National Institutes of Health, National Heart and Lung Institute, Bethesda, Md.). *American Heart Journal*, vol. 87, June 1974, p. 722-730. 25 refs. Grant No. NIH-PH-43-63-1139.

An epidemiologic study was carried out on 1,393 cases of coronary heart disease in World War II Army men by comparing these cases with representative age-matched Army controls using data from military records of both groups. Factors showing significant association with the development of angina pectoris, coronary insufficiency, myocardial infarction, and death from CHD at this young age (average: 39.6 years) were: higher systolic and diastolic blood pressure, higher weight and ratio of actual-to-standard weight, aspects of body build as measured by a greater chest circumference, heavy frame, and being shorter than the matched controls. P.T.H.

A74-38124 **Conduction defects in experimental atrial arrhythmia.** P. R. Montgomery and P. E. Dresel (Manitoba, University, Winnipeg, Canada). *American Heart Journal*, vol. 88, Aug. 1974, p. 191-197. 25 refs. Research supported by the Medical Research Council of Canada.

The response of the atria to early diastolic stimuli was studied in isolated dog hearts by a technique proposed by Alanis et al. (1958) and modified by Kirk and Dresel (1965). The hearts were driven at rates sufficient to suppress natural pacemakers with steel-clip electrodes placed on or near the sinoatrial node. A Tektronix stimulator yielded 5 msec square wave pulses at 1.5 threshold strength. Acetylcholine chloride was infused into the perfusate by a continuously variable Harvard pump. The measurements of the effects single extra stimuli and multiple extra stimuli showed no indication of altered conduction to the various recording sites of stimuli which caused arrhythmia. V.Z.

A74-38125 **Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram.** Y. Nimura, M. Matsumoto, S. Beppu, H. Matsuo, H. Sakakibara, and H. Abe (Osaka University, Osaka, Japan). *(American Institute of Ultrasonics in Medicine, Annual Meeting, 17th, Philadelphia, Pa., Oct. 29-Nov. 1, 1972.) American Heart Journal*, vol. 88, Aug. 1974, p. 240-250. 39 refs.

The ultrasonic reflection technique introduced by Ebina et al. (1967) was applied in the examination of two cor triatriatum cases in an attempt to develop a noninvasive preoperative diagnostic method for this congenital malfunction by using ultrasonocardiotomograms in combination with conventional echocardiograms. The echo from an anomalous septum was found in the left atrial area on a conventional echocardiogram and two-dimensional ultrasonocardiotomograms. The findings are believed to contribute to the development of preoperative and differential diagnoses of cor triatriatum from mitral stenosis. V.Z.

A74-38232 **Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973.** Symposium sponsored by the Biotronex Laboratory, Inc. and U.S. Army. Edited by C. M. Bloor (California, University, La Jolla, Calif.) and R. A. Olsson (U.S. Army, Walter Reed Army Institute of Research, Washington, D.C.). New York, Plenum Press (Advances in Experimental Medicine and Biology. Volume 39), 1973. 311 p. $17.50.

The metabolic control of coronary blood flow is considered, giving attention to challenges to the adenosine hypothesis for the regulation of coronary blood flow, observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilatation, and coronary and systemic hemodynamics in chemically sympathectomized dogs. Other subjects discussed are related to transmural myocardial flow gradients, coronary collateral circulation, and clinical problems in the coronary circulation.

Individual items are announced in this issue. G.R.

A74-38233 **Challenges to the adenosine hypothesis for the regulation of coronary blood flow.** R. M. Berne and R. Rubio (Virginia, University, Charlottersville, Va.). In: Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973. (A74-38232 19 04) New York, Plenum Press, 1973, p. 3-10. 24 refs.

It has been assumed that adenosine is involved in reactive hyperemia and in the adjustment of coronary blood flow to myocardial needs. Points raised by critics of the adenosine hypothesis are considered. The role of dipyridamole and lidoflazine in myocardial reactive hyperemia is examined along with the effects produced by aminophylline and theophylline. Questions concerning the sites of adenosine accumulations in hypoxic myocardium are discussed and the regulation of coronary resistance vessel caliber by oxygen is considered. G.R.

A74-38234 **Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation.** T. W. Moir and P. K. Jones (Case-Western-Reserve University, Cleveland, Ohio). In: Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973. New York, Plenum Press, 1973, p. 11-26. 21 refs.

A74-38235 **Role of O2 in control of the coronary capillary reserve.** C. R. Honig (Rochester, University, Rochester, N.Y.) and J. Bourdeau-Martini (Paris, Université, Orsay, Essonne, France). In: Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973. New York, Plenum Press, 1973, p. 55-71. 22 refs. Grant No. NIH-HE-03290.

A summary is provided regarding the present state of knowledge of coronary capillary circulation and a biochemical mechanism is suggested for the control of coronary capillaries by oxygen. Attention is given to the coronary capillary reserve, effects of oxygen on capillary density and mean intercapillary distances, and the mechanisms of circulation-metabolism coupling. Two classes of theories are considered to explain the effects of oxygen. G.R.

A74-38236 **Factors determining the distribution and adequacy of left ventricular myocardial blood flow.** G. D. Buckberg and A. A. Kattus, Jr. (California, University, Los Angeles, Calif.). In: Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973. New York, Plenum Press, 1973, p. 95-113. 38 refs. PHS-supported research.

The factors comprising the index of potential subendocardial blood supply have been altered experimentally by three different approaches. Questions of phasic and regional coronary flow are considered together with aspects of myocardial flow distribution and supply/demand relationships, the significance of altered flow distributions, subendocardial/subepicardial flow ratios, left ventricular ischemia with left ventricular systolic hypertension, the effects of left ventricular diastolic pressure on subendocardial flow, and isoproterenol-induced myocardial necrosis. G.R.

A74-38237 **The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion.** W. Schaper, W. Flameng, B. Wüsten, and J. Palmowski (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Bad Nauheim, West Germany). In: Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973. New York, Plenum Press, 1973, p. 151-160. 11 refs.

The regional distribution of the collateral flow was studied with the aid of a modified tracer microsphere method. The investigation reported included a study of the physiological distribution of myocardial flow in the normal heart of mongrel dogs and a determination of the physiological distribution of flow in the normal heart of pure bred beagles. Other studies conducted were concerned with collateral flow after acute coronary occlusion in mongrel dogs and beagles. The distribution of myocardial flow after 'critical' stenosis of the left circumflex coronary artery was also studied. G.R.

A74-38263 # **Plane oscillatory flow past rectangular obstacles.** L.-C. Cheng (Sargent Lundy Consulting Engineers, Chicago, Ill.), M. E. Clark, and J. M. Robertson (Illinois, University, Urbana, Ill.). *(American Society of Civil Engineers, Annual and National Environmental Engineering Meeting, New York, N.Y., Oct. 29-Nov. 1, 1973.) American Society of Civil Engineers, Engineering Mechanics Division, Journal*, vol. 100, Aug. 1974, p. 707-718. 7 refs.

The present work studies the fluid dynamics of nonturbulent, oscillatory conduit flow past a rectangular obstacle on the wall. The nature of the flow is found by solving the unsteady, viscous, vorticity-transport equation by finite-difference methods. It was found that overall pressure drop is significantly affected by obstacle geometry. The energy loss factor increases approximately linearly with obstacle width but increases rapidly with increase in height as the flow becomes throttled. The purpose of the study was to provide some quantitative information needed to achieve a better understanding of the basic fluid mechanics phenomena in the human circulatory system and in prosthetic modifications of it. P.T.H.

A74-38285 # **Measurement of the motor activity of test animals (Pomiar aktywnosci ruchowej zwierzat doswiadczalnych).** B. Cudny. *Pomiary, Automatyka, Kontrola*, vol. 20, July 1974, p. 289-291. In Polish.

A device is described which eliminates the disadvantages involved in the measurement of motions or convulsions of laboratory animals by direct implantation of transducers on them. The vertical component of the dynamic force generated by the animal is measured by a rectangular bridge of resistance strain gauges that forms the floor of the animal's cage. To make the output voltage independent of the point of application of the force (i.e., the position of the animal in the cage), two opposite sides of the bridge consist of tensile strain gauges, and the other two, of compression strain gauges. The block diagram of the device is discussed. V.P.

A74-38289 **Computer analysis of ultrasoundcardiograms.** F. D. Ledley and J. B. Wilson (Georgetown University, Washington, D.C.). *Computers in Biology and Medicine*, vol. 4, June 1974, p. 27-41. 12 refs. Grants No. NIH-GM-15192; No. NIH-RR-05681.

Ultrasoundcardiography is a sonar-like method of viewing the internal workings of the heart. In this paper we describe the application of digital computers to the automatic analysis of ultrasoundcardiograms. The computer recognizes the structure being studied, eliminates noise, corrects the curve for dropout and the effects of noise, and makes a statistical analysis of the curve, for use in research or clinical diagnosis. The digital computer extends the potential of this already significant noninvasive method for analyzing intracardial structures, by increasing the accuracy and the types of data that can be obtained. (Author)

A74-38290 **The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine.** Y. K. Liu and D. U. von Rosenberg (Tulane University, New Orleans, La.). *Computers in Biology and Medicine*, vol. 4, June 1974, p. 85-106. 27 refs. Contracts No. F33615-70-C-1565; No. F33615-72-C-1212; Grant No. NIH-GM-19107-01.

Analysis of a beam-column model of the human spine subjected to a caudocephalad acceleration, using a finite-difference numerical technique. It is shown that a previous analytical treatment of this problem by an assumed-mode method is valid only for either very low levels of acceleration pulse or for very early times in the response, i.e., while the initial configuration of the spine is little changed by the dynamics. The generated numerical results, using a 20 g step acceleration input, show that the initial configuration is so appreciably changed as to invalidate the results of the assumed-mode analysis. M.V.E.

A74-38343 # **Reaction of central auditory neurons to signals with different directions of frequency modulation (Reaktsii tsentral'nykh slukhovykh neironov na signaly s razlichnym napravleniem chastotnoi moduliatsii).** I. A. Vartanian (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR). *Neirofiziologiia*, vol. 6, May-June 1974, p. 237-245. 16 refs. In Russian.

A74-38344 # **Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord (Lokalizatsiia i svoistva retikulo-spinal'nykh neironov, aksony kotorykh prokhodiat v dorsolateral'nykh otdelakh bokovykh kanatikov spinnogo mozga).** K. A. Smirnov and I. L. Potekhina (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Neirofiziologiia*, vol. 6, May-June 1974, p. 266-272. 20 refs. In Russian.

A74-38345 # **Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells (Kharakteristiki elektrotonicheskogo rasprostraneniia po dendritnomu derevu ganglioznykh kletok setchatki).** M. I. Venslauskas and A. I. Gutauskas (Kaunasskii Meditsinskii Institut, Kaunas, Lithuanian SSR). *Neirofiziologiia*, vol. 6, May-June 1974, p. 304-311. 13 refs. In Russian.

A74-38394 **Contamination of scalp EEG spectrum during contraction of cranio-facial muscles.** R. D. O'Donnell, J. Berkhout, and W. R. Adey (California, University, Los Angeles, Calif.). *Electroencephalography and Clinical Neurophysiology*, vol. 37, Aug. 1974, p. 145-151. 10 refs. Contract No. F44620-70-C-0017; Grant No. NIH-RR-3.

Autospectral and coherence values determined for three EEG and three EMG derivations, two cranio-facial muscles, and the biceps during separate 90 sec periods of strong contraction are presented. Coherences between EEG derivations show considerable increases during muscle contraction only at frequencies above 14 c/sec. Coherence between EEG and EMG derivations were large only when one EEG electrode was located over the muscle. M.V.E.

A74-38472 **The effect of intensity on the localization of different acoustical stimuli in the vertical plane.** R. J. Davis and S. D. G. Stephens (Southampton, University, Southampton, England). *Journal of Sound and Vibration*, vol. 35, July 22, 1974, p. 223-229. 9 refs. Medical Research Council Grant No. 970/512-C.

Two experiments have been carried out to investigate the effects of using different stimuli, various intensities, and repeated stimulus presentation on the ability to localize sounds in the vertical plane. It was found that noise can be localized more accurately than a speech stimulus. Increasing the sensation level of the stimulus reduces localizational errors up to a sensation level of 70 dB, where the error appears to reach a plateau at about 3.5. There is little or no apparent learning process involved in the task of auditory localization. (Author)

A74-38501 **Evaluation of the thermal debt starting from body temperatures during immersions in cold water (Evaluation de la dette thermique à partir des températures corporelles lors des immersions en eau froide).** C. Boutelier, J. Timbal, and J. Colin (Centre d'Essais en Vol, Brétigny-sur-Orge, Essonne, France). *Revue de Médecine Aéronautique et Spatiale*, vol. 13, 2nd Quarter, 1974, p. 113-118. 8 refs. In French.

The thermal debt is essential data to evaluate the tolerance to cold or the effectiveness of anti-immersion clothing. In the course of numerous immersion experiments in cold water, it was found that the value of the thermal debt starting from mean skin and rectal temperatures, using the coefficient x proposed by Hardy et al. (1941) was in most cases greatly overestimated. Therefore it appeared interesting to undertake the study of the calculation of the mean body temperature and its variation in the course of immersion experiments in cold water and to determine the coefficients affecting the rectal and mean skin temperatures. F.R.L.

A74-38502 **The treatment of pulmonary tuberculosis and the suitability of aircrew (Le traitement de la tuberculose pulmonaire et l'aptitude du personnel navigant).** R. Pannier (Hôpital d'Instruction des Armées Dominique Larrey, Versailles, France). *Revue de Médecine Aéronautique et Spatiale*, vol. 13, 2nd Quarter, 1974, p. 119-121. In French.

The medications usually used are isoniazid, rifampicine, and ethambutol. Isoniazid classically constitutes the essential element of treatment. It is a powerful antibacilliary agent whose therapeutic index is high. Isoniazid can be responsible for a certain number of side effects: transitory digestive troubles, and allergic manifestations, but the basic difficulty rests with neurological and especially psychical complications. It is considered that treatment with isoniazid does not justify withdrawing aircrew from duty for 18 months, and that treatment with isoniazid is compatible with aeronautical activity. F.R.L.

A74-38503 **Action of low frequency vibrations on cardiac quickness and variability (Action des vibrations de basse fréquence sur la fréquence et la variabilité cardiaques).** R. Auffret (Ministère des Armées, Service de Santé des Armées, Paris, France), J. Demange, and B. Vettes. *Revue de Médecine Aéronautique et Spatiale*, vol. 13, 2nd Quarter, 1974, p. 122-126. 9 refs. In French.

In the last 20 years interest in the study of human performance when subjected to vibrations has been considerably stimulated by military programs and especially the study of penetration flight at low altitude and high speed. This work has the advantage of having been carried out with low frequency vibrations which physiologically are most stressful for man and the most common in daily life. The effect of the vibrations studied (10 Hz for 30 min along the X axis, and plus or minus 0.5 g and plus or minus 0.7 g) are moderate on cardiac quickness. They are more marked and become significant for cardiac variability which is a more sensitive parameter than the simple frequency. This action is more marked when the vibrational stress has a greater amplitude for the same frequency. F.R.L.

A74-38504 **Reflections on the psychological selection of military aviation aircrew (Réflexions sur la sélection psychologique du personnel navigant de l'aéronautique militaire).** R. Angiboust (Ministère des Armées, Service de Santé des Armées, Paris, France). *Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter 1974, p. 127-130. 6 refs. In French.

The methods of psychological selection reflect two fundamentally different perspectives. The first, very close to medical selection, attempts to detect among the candidates for a profession those who present character traits or emotional reactions which are not compatible with the normal exercise of the profession. The second, based much more on the social and economic demands, proposes to classify candidates as a function of a prognosis on future professional success, in order to choose only the most apt. In making a review of methods which have been utilized successively in France and abroad to select aviators, it is shown that they oscillate between these two poles. F.R.L.

A74-38505 **Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew (Protocole d'examen d'une paire de lunettes 'antiéblouissement' déstinée au personnel navigant).** G. Santucci (Centre de Recherches de Médecine Aéronautique, Paris, France) and J.-P. Chevaleraud. *Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 131-133. In French.

It is considered that a study of glass, intended to protect against dazzle, must bear on numerous parameters of the visual function. Each parameter must be separately studied, and if possible by different means. Certain essential parameters in the vision of the aviator are considered, i.e., visual acuity, depth perception, color vision, and sensitivity to dazzle. This study confirms the risk taken by aircrew who use for protection glasses the characteristics of which they are ignorant, and the repercussions on their visual information. F.R.L.

A74-38506 **New concepts of medical facilities aboard large-capacity aircraft (Nouvelles conceptions des moyens médicaux à bord des avions de grande capacité).** J. Pasquet and E. Lafontaine (Compagnie Nationale Air France, Paris, France). *Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 134-137. In French.

For a long time it has seemed necessary to put first aid kits aboard airliners. In effect, a certain number of sudden pathological events, benign or serious, can happen unexpectedly in the course of flights without landing, which can last several hours. However, since the creation of these kits, new elements, in particular the unexpected arrival of mass transport, justify a reevaluation of the medical facilities necessary on board. The needs and actual regulation are successively reviewed, and the new concept of medical facilities aboard aircraft of large capacity is discussed. F.R.L.

A74-38507 **In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/ (Les incapacités subites en vol des pilotes professionnels dans l'aviation civile Française /de 1948 à 1972/).** J. Raboutet and P. Raboutet. *Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 138-140. In French.

A74-38508 **The doctor-pilot relationship (La relation médecin-pilote).** J.-C. Hadni. *Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 141-144. In French.

A74-38509 **Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia.** L. A. Piruzian and I. A. Maksimova. *(Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 21-28, 1972.) Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 146-150.

A74-38510 **Visual elements of the ergonomic evaluation of a new integrated instrument panel (Eléments visuels de l'évaluation ergonomique d'un nouveau tableau de bord intégré).** G. Raynaud and R. Bru (Hôpital des Armées Dominique Larrey, Versailles, France). *(Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 21-28, 1972.) Revue de Médecine Aéronautique et Spatiale,* vol. 13, 2nd Quarter, 1974, p. 151-153. In French.

Electronic technology offers the integration of the presentation of useful parameters (selected and evaluated to simplify the pilot's load) on the same cathode tube in color. The Electronic Attitude Director Indicator (EADI) developed by the Compagnie Thomson CSF is discussed. It is considered that the reading of the EADI requires only 3 to 4/10 of visual acuity; that it is comfortable under all illuminations except under direct insolation (this handicap is less troublesome when the aircraft has higher performance and possesses smaller exterior openings). F.R.L.

A74-38527 **Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design.** C. R. Bond, Jr. (Lear Siegler, Inc., Grand Rapids, Mich.). In: NAECON '74; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 13-15, 1974. (A74-38517 19-09) New York, Institute of Electrical and Electronics Engineers, Inc., 1974, p. 96-99.

Questions of system design are considered, giving attention to mission capabilities planning, aspects of avionic subsystem development, and avionic system operational design. A computer controller for an avionic system digital computer commonly consists of the data input keyboard and alphameric display used for manual data entry. Two tactical navigation avionic systems which require computer controllers of large capacity are considered. An interactive controller was designed to meet the needs for an extensive data management capability and total system growth capabilities. G.R.

A74-38600 **Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys.** E. Arnauld, J. D. Vincent (Bordeaux, Université, Bordeaux, France), and J. J. Dreifuss (Bordeaux, Université, Bordeaux, France; Genève, Université, Geneva, Switzerland). *Science,* vol. 185, Aug. 9, 1974, p. 535-537. 19 refs. Research supported by the Centre National de la Recherche Scientifique and Fondation pour la Recherche Médicale.

A74-38646 **Electrophysiological evidence for colour channels in human pattern vision.** D. Regan (Keele, University, Keele, Staffs., England). *Nature,* vol. 250, Aug. 2, 1974, p. 437-439. 24 refs. Research supported by the Medical Research Council.

Results of electrophysiological measurements of brain activity to determine spectral sensitivity curves for the red-sensitive and green-sensitive channels of human pattern vision. The principle of the experiments carried out was to compare disks of different wavelengths in their ability to attenuate evoked potentials (EPs) produced by red or green patterns. The sensitivity of red pattern EPs is found to be displaced markedly toward the red end of the spectrum and to peak at 580-600 nm, while the green pattern's spectral sensitivity curve peaks at much shorter wavelengths (540-560 nm). An attempt is made to determine the extent to which the EP curves obtained for red and green patterns represent the action spectra of red-sensitive and green-sensitive channels in pattern vision. It is concluded that the curve obtained with a green pattern represents the action spectrum of the green photopigment, while the curve obtained with the red pattern describes, though with rather less precision, the action spectrum of the red pigment. A.B.K.

A74-38676 # **Microwaves and man's safety (SVCh i bezopasnost' cheloveka).** B. A. Minin. Moscow, Izdatel'stvo Sovetskoe Radio, 1974. 352 p. 201 refs. In Russian.

Means of preventing microwave health hazards are examined, along with methods of measuring antenna fields and inner radiation fields that may arise when dealing with microwave radars, radar navigation, broadcasting, and communications. Some data obtained in studies of the biological effects of microwaves are reviewed. V.P.

A74-38703 * The Manned Spacecraft Center and medical technology. R. S. Johnston and S. L. Pool (NASA, Johnson Space Center, Houston, Tex.). In: Health care systems; Proceedings of User-Developer Conference on Health Care Systems, Dallas, Tex., November 21, 22, 1972. Conference sponsored by the American Astronautical Society. Tarzana, Calif., American Astronautical Society (Science and Technology Series. Volume 32), 1974, p. 75-100.

A number of medically oriented research and hardware development programs in support of manned space flights have been sponsored by NASA. Blood pressure measuring systems for use in spacecraft are considered. In some cases, complete new bioinstrumentation systems were necessary to accomplish a specific physiological study. Plans for medical research during the Skylab program are discussed along with general questions regarding space-borne health service systems and details concerning the Health Services Support Control Center. G.R.

A74-38851 # Oxygen transport during exercise in human subjects. L. Hermansen. *Acta Physiologica Scandinavica,* Supplementum no. 399, 1973. 101 p. 173 refs.

An attempt is made to elucidate further some of the questions concerning the oxygen transport system in man. More specifically the aim is to study the respiratory and circulatory responses to treadmill and bicycle exercise, and to compare the results from these two most frequently employed testing devices. Also, the effect of variations in the relative and total hemoglobin content of the blood on the maximal oxygen uptake is evaluated. A study is made of the relationship between maximal oxygen uptake and capillary density (i.e., number of capillaries/sq mm) in subjects characterized by high as opposed to average maximal oxygen uptake. The variation in maximal oxygen uptake in relation to sex, age, and level of physical activity in samples of the Norwegian population is described. F.R.L.

A74-38856 Loudness discomfort level under earphone and in the free field - The effects of calibration methods. D. E. Morgan and D. D. Dirks (California, University, Los Angeles, Calif.). *Acoustical Society of America, Journal,* vol. 56, July 1974, p. 172-178. 22 refs.

Loudness discomfort level (LDL) experiments are described whose results indicate that: (1) there is no intensity level increase in the low frequency LDL under earphone, and (2) there are no differences between earphone and free field LDL and loudness balance judgments. The relationship between these data and previously published differences between minimum audible pressure and minimum audible field are discussed. M.V.E.

A74-38857 Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation. G. R. Price (U.S. Army, Human Engineering Laboratory, Aberdeen Proving Ground, Md.). *Acoustical Society of America, Journal,* vol. 56, July 1974, p. 183-189. 13 refs.

In order to gain a better understanding of the complex behavior of the ear to intermittent stimulation, the loss processes operative at the most peripheral level were studied by monitoring the cochlear microphonic sensitivity at the round window in a series of acute experiments on 150 cat ears as they were exposed to intermittent or continuous 5.0-kHz pure-tone stimulation. The results suggest the possibility that large losses to intermittent stimuli are likely to result when successive stimuli in the intermittent train interrupt the early recovery process before it has run to completion. These data are compared with human ear data, and parallels are pointed out. M.V.E.

A74-38858 Transformation function of the external ear in response to impulsive stimulation. G. R. Price (U.S. Army, Human Engineering Laboratory, Aberdeen Proving Ground, Md.). *Acoustical Society of America, Journal,* vol. 56, July 1974, p. 190-194. 12 refs.

A model of an external human ear and live cat ears instrumented with condenser microphones were exposed to gun fire and narrow-band acoustic clicks in the measurement of auditory transformation function responses to impulsive stimulation in order to determine the energy that actually reaches the cochlea during impulsive stimulation. In all cases the transformation function obtained by a Fourier transform of the impulses matched reasonably well the transformations determined by pure-tone or 1/3-octave-band random-noise measurements. The rise time of gunfire impulses increased markedly at the eardrum position as compared with the open field. V.Z.

A74-38859 Upper limit to stapes displacement - Implications for hearing loss. G. R. Price (U.S. Army, Human Engineering Laboratory, Aberdeen Proving Ground, Md.). *Acoustical Society of America, Journal,* vol. 56, July 1974, p. 195-197. 20 refs.

Based on calculations from existing data, the human middle ear appears to have a displacement limit of about 30 microns peak to peak and becomes nonlinear at about 10 microns peak to peak. This nonlinearity begins at free-field SPLs of 110 to 120 dB in the midrange of frequencies. The presence of an absolute limit to stapes displacements indicates that at high SPLs there is a high-frequency bias in the conducting mechanism which may in part be responsible for the high-frequency hearing loss commonly seen following industrial and/or impulsive noise exposure. (Author)

A74-38894 Toxicology of polymeric materials exposed to heat and fires. L. J. Nunez, J. Autian (Tennessee, University, Memphis, Tenn.), and S. K. De (Indian Institute of Technology, Kharagpur, India). *Journal of Fire and Flammability, Combustion Toxicology Supplement,* vol. 1, May 1974, p. 124-137. 22 refs.

The toxic possibilities of materials are considered, primarily those which are man-made polymers, when they are exposed to heat and fire. The toxicologist should be aware of all the factors even though he may have greater interest in absence of oxygen, presence of carbon monoxide, and presence of other gases. A general review is given of the factors which can lead to death or injury of persons in the environment of a fire, and an experimental approach is described which can help evaluate the toxic nature of thermodegradation and combustion products of polymeric materials. It is considered that there is a still urgent need to develop testing systems which can be used to rate the toxic liability of burning materials. F.R.L.

A74-38911 * A model of heat transfer in immersed man. L. D. Montgomery (NASA, Ames Research Center, Moffett Field, Calif.). *Annals of Biomedical Engineering,* vol. 2, 1974, p. 19-46. 32 refs.

An equation representing man's thermal balance under water is considered. The equation states that the body thermal loading from metabolic heat production and artificial heat input must be offset by respiratory and environmental heat exchange to maintain a constant body temperature. Critical body regions are affected by cold-water thermal stress. A model of the thermoregulatory system may be divided into the physical-controlled system and the dynamic controlling system. The thermal model is simulated by computer programs. G.R.

A74-38915 * Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen. P. C. Sakellaris and J. Vernikos-Danellis (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, Calif.). *Physiology and Behavior,* vol. 12, 1974, p. 1067-1070. 17 refs.

Experiments are described which were designed to assess the degree of adaptation that occurs in rats chronically exposed to the

stress of a water-deprivation regimen and to determine if that adaptation represents a normalization of the hypothalamic-pituitary-adrenal axis. There were no significant differences in mean corticosterone concentrations among control nondeprived rats 1, 4, and 8 weeks after the start of the experiment. The water-deprived rats, however, had significantly elevated plasma steroids 1 and 4 weeks after the onset of deprivation as compared to controls, but not after 8 weeks. Thus, there was a significant decrease in mean plasma corticosterone levels during water deprivation from 1 week to 8 weeks. F.R.L.

A74-39114 # **NS-100 membranes for reverse osmosis applications.** L. T. Rozelle, C. V. Kopp, Jr., J. E. Cadotte, and K. E. Cobian (North Star Research Institute, Minneapolis, Minn.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-1.* 4 p. 11 refs. Members, $1.00; nonmembers, $3.00. U.S. Department of the Interior Grant No. 14-30-2883.

The structure of the new NS-100 nonpolysaccharide reverse osmosis membranes and additional separation properties relating to removal of impurities from water has been investigated. Infrared spectrophotometric evidence has indicated that the urea linkages are formed before the heat cure step. The heat curing process was found to cross-link the polymer further by elimination of ammonia and formation of additional secondary and tertiary amine linkages. Long-term tests under seawater conditions have indicated water fluxes of 18 gdf at 99.5 per cent salt rejection. The NS-100 membranes have exhibited high rejections toward organic compounds; for example, phenol is rejected up to 90 per cent. All experimental data indicate that the NS-100 membranes are more resistant to varying environments with higher reverse osmosis performance than any current commercial membrane. (Author)

A74-39115 * # **Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems.** L. J. Nuttall and W. A. Titterington (General Electric Co., Lynn, Mass.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-2.* 8 p. Members, $1.00; nonmembers, $3.00. NASA-supported research.

Details of the design and system verification test results are presented for a six-man-rated oxygen generation system. The system configuration incorporates components and instrumentation for computer-controlled operation with automatic start-up/shutdown sequencing, fault detection and isolation, and with self-contained sensors and controls for automatic safe emergency shutdown. All fluid and electrical components, sensors, and electronic controls are designed to be easily maintainable under zero-gravity conditions. On-board component spares are utilized in the system concept to sustain long-term operation (six months minimum) in a manned spacecraft application. The system is centered on a 27-cell solid polymer electrolyte water electrolysis module which, combined with the associated system components and controls, forms a total system envelope 40 in. high, 40 in. wide, and 30 in. deep. (Author)

A74-39116 * # **G189A analytical simulation of the RITE Integrated Waste Management-Water System.** J. V. Coggi (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.) and S. E. Clonts (NASA, Marshall Space Flight Center, Huntsville, Ala.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-8.* 10 p. Members, $1.00; nonmembers, $3.00. Contract No. NAS8-28982.

This paper discusses the computer simulation of the Integrated Waste Management-Water System Using Radioisotopes for Thermal Energy (RITE) and applications of the simulation. Variations in the system temperature and flows due to particular operating conditions and variations in equipment heating loads imposed on the system were investigated with the computer program. The results were assessed from the standpoint of the computed dynamic characteristics of the system and the potential applications of the simulation to system development and vehicle integration. (Author)

A74-39117 # **Spacecraft nitrogen resupply technology Nitrogen/hydrogen separation.** R. D. Marshall (Life Systems, Inc., Cleveland, Ohio). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-9.* 9 p. 8 refs. Members, $1.00; nonmembers, $3.00.

In spacecraft operation, it is necessary to replace cabin air lost through cabin leakage. The nitrogen (N2) component of air can be replaced using an on-board N2 generator. The N2 would be stored as liquid hydrazine (N2H4) and the N2H4 catalytically dissociated to yield a mixture of N2 and hydrogen (H4). The N2/H4 mixture is then separated to yield the makeup, N2. The excess supply of H4 would be available for use in the reduction of metabolic carbon dioxide. This paper discusses two attractive N2/H4 separation processes for integration into a spacecraft N2 generator. (Author)

A74-39118 * # **Integrated water and waste management system for future spacecraft.** A. L. Ingelfinger (NASA, Washington, D.C.) and R. W. Murray (GE Space Center, Valley Forge, Pa.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-10.* 4 p. Members, $1.00; nonmembers, $3.00. AEC-NASA-USAF-supported research.

Over 200 days of continuous testing have been completed on an integrated waste management-water recovery system developed by General Electric under a jointly funded AEC/NASA/AF Contract. The 4 man system provides urine, feces, and trash collection; water reclamation; storage, heating and dispensing of the water; storage and disposal of the feces and urine residue and all of other nonmetallic waste material by incineration. The heat required for the 1200 deg F purification processes is provided by a single 420-w radioisotope heater. A second 836-w radioisotope heater supplemented by 720 w of electrical heat provides for distillation and water heating. Significant test results are no pre-or-post treatment, greater than 98 per cent potable water recovery, approximately 95 per cent reduction in solids weight and volume, all outflows are sterile with the water having no bacteria or virus, and the radioisotope capsule radiation level is only 7.9 mrem/hr unshielded at 1 m (neutrons and gamma). (Author)

A74-39119 * # **Pulse-modulated dual-gas control subsystem for space cabin atmosphere.** J. K. Jackson (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-13.* 13 p. Members, $1.00; nonmembers, $3.00. Contract No. NAS9-12924.

An atmosphere control subsystem (ACS) was developed for use in a closed manned cabin, such as the Space Shuttle Orbiter. This subsystem uses the Perkin Elmer mass spectrometer for continuous measurement of major atmospheric constituents (H2, H2O, N2, O2, and CO2). The O2 and N2 analog signals are used as inputs to the controller, which produces a pulse-frequency-modulated output to operate the N2 gas admission solenoid valve and an on-off signal to operate the O2 valve. The proportional controller characteristic results in improved control accuracy as compared with previously used on-off controllers having significant dead-band. A 60-day evaluation test was performed on the ACS during which operation was measured at various values of control setpoint and simulated cabin leakage. (Author)

A74-39120 * # **Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application.** F. H. Schubert (Life Systems, Inc., Cleveland, Ohio) and P. D. Quattrone (NASA, Ames Research Center, Moffett Field, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-16.* 12 p. 12 refs. Members, $1.00; nonmembers, $3.00.

Life Systems, working with NASA, has developed an electrochemical, six-man, self-contained carbon dioxide concentrator sub-

system (CX-6) designed to normally remove 13.2 lb/day of CO2 while maintaining the CO2 partial pressure (pCO2) of the cabin atmosphere at 3 mm Hg or less. The CX-6 was subjected to extensive parametric and endurance testing. The effects of operating conditions on CO2 removal and electrical efficiencies were determined, including effects of hydrogen (H2) flow rate, process airflow rate, pCO2, operating temperature and current density. A total of 209 days of operation was accumulated. The subsystem was designed with self-contained electronic control and monitoring instrumentation. The CX-6 was redesigned and repackaged into the CO2 collection subsystem for the air revitalization group of the space station prototype. (Author)

A74-39121 * # **The potable water system in Skylab.** R. L. Sauer and J. B. Westover (NASA, Johnson Spacecraft Center, Houston, Tex.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-17.* 9 p. Members, $1.00; nonmembers, $3.00.

Description of the medical requirements, development, system operation, and in-flight performance of the Skylab potable water system. Emphasized is the description of the unique features involving new space-flight concepts, procedures, and design incorporated in Skylab. The water supplied to the three Skylab missions was preloaded in stainless-steel tanks. These tanks were fitted with positive expulsion stainless-steel bellows. In-flight iodination of the water, for bacterial control, was accomplished as required. An in-flight bactericide monitor was used periodically to determine the level of bactericide in the water. Prior to the delivery of the water to the crewmen for consumption, the water was passed through a cation exchange resin for metallic ion removal and then heated for food reconstitution or chilled for drinking. (Author)

A74-39122 * # **Development of a filter regeneration system for advanced spacecraft fluid systems.** A. F. Behrend, Jr. (NASA, Johnson Space Center, Houston, Tex.) and V. A. DesCamp (Martin Marietta Aerospace, Denver, Colo.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-18.* 9 p. Members, $1.00; nonmembers, $3.00.

The development of a filter regeneration system for efficiently cleaning fluid particulate filters is presented. Based on a backflush/jet impingement technique, the regeneration system demonstrated a cleaning efficiency of 98.7 to 100%. The operating principles and design features are discussed with emphasis on the primary system components that include a regenerable filter, vortex particle separator, and zero-g particle trap. Techniques and equipment used for ground and zero-g performance tests are described. Test results and conclusions, as well as possible areas for commercial application, are included. (Author)

A74-39124 # **Development of a prototype module for a non-cryogenic N2/O2 supply system.** B. M. Greenough and R. E. Mahan (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-21.* 12 p. 5 refs. Members, $1.00; nonmembers, $3.00.

The development of a prototype modular nitrogen/oxygen supply system has proceeded through design, fabrication, and testing. The system is characterized as a dual matrix, liquid center, cellular type, with circulating electrolyte. It electrolyzes water and hydrazine hydrate to provide both metabolic oxygen for crew needs and the oxygen and nitrogen required for spacecraft cabin leakage makeup. Preceding the fabrication and assembly of the engineering prototype module, a one-man, breadboard system had accumulated over 1000 hours of testing, utilizing both water and hydrazine hydrate. Individual components designed, fabricated, and subjected to design verification tests were a power controller, reservoir/feed controller, phase separator/pump, base plate containing integral electrolyte and gas passages, molded cell spacers, and a heat exchanger. (Author)

A74-39128 * # **Life support subsystem monitoring instrumentation.** J. D. Powell and G. D. Kostell (Life Systems, Inc., Cleveland, Ohio). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-25.* 16 p. 6 refs. Members, $1.00; nonmembers, $3.00. Contracts No. NAS2-6118; No. NAS2-6478.

The recognition of the need for instrumentation in manned spacecraft life-support subsystems has increased significantly over the past several years. Of the required control and monitoring instrumentation, this paper will focus on the monitoring instrumentation as applied to life-support subsystems. The initial approach used independent sensors, independent sensor signal conditioning circuitry, and independent logic circuitry to provide shutdown protection only. This monitoring system was replaced with a coordinated series of printed circuit cards, each of which contains all the electronics to service one sensor and provide performance trend information, fault detection and isolation information, and shutdown protection. Finally, a review of sensor and instrumentation problems is presented, and the requirement for sensors with built-in signal conditioning and provisions for in situ calibration is discussed. (Author)

A74-39134 * # **Heat pipe thermal conditioning panel.** E. W. Saaski (Donald W. Douglas Laboratories, Richland, Wash.), J. D. Loose, and K. E. McCoy (NASA, Marshall Space Flight Center, Huntsville, Ala.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-37.* 9 p. Members, $1.00; nonmembers, $3.00. Contract No. NAS8-28639.

Thermal control of electronic hardware and experiments on future space vehicles is critical to proper functioning and long life. Thermal conditioning panels (cold plates) are a baseline control technique in current conceptual studies. Heat generating components mounted on the panels are typically cooled by fluid flowing through integral channels within the panel. However, replacing the pumped fluid coolant loop within the panel with heat pipes offers attractive advantages in weight, reliability, and installation. This report describes the development and fabrication of two large 0.76 x 0.76 m heat pipe thermal conditioning panels to verify performance and establish the design concept. (Author)

A74-39135 # **Space Shuttle heat pipe thermal control systems design and test.** J. Alario (Grumman Aerospace Corp., Bethpage, N.Y.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-38.* 13 p. 7 refs. Members, $1.00; nonmembers, $3.00.

This paper presents the design details and test results for three heat pipe thermal control systems designed for possible shuttle applications. Two of the systems are for electronics cooling and the third for compartment temperature control. The test results support the feasibility of using these selected heat pipe systems to satisfy shuttle thermal control requirements. (Author)

A74-39136 * # **An evaluation of Orbital Workshop passive thermal control surfaces.** D. J. Daniels, P. I. Kawano, W. D. Sieker, D. E. Walters, G. F. Witherspoon, and D. W. Grunditz (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-39.* 8 p. Members, $1.00; nonmembers, $3.00. Contract No. NAS9-6555.

The optical properties of selected Orbital Workshop thermal control surfaces are discussed from the time of their installation through the end of the Skylab missions. The surfaces considered are the goldized Kapton tape on the habitation area sidewall, the S-13G white paint on the Workshop aft skirt, and the multilayer insulation system on the forward dome of the habitation area. A quantitative assessment of the effects of exposure to the ascent and orbital environments is made including the effects of rocket exhaust plume contamination. Although optical property degradation of the

external surfaces was noted, satisfactory thermal performance was maintained throughout the Skylab missions. (Author)

A74-39137 # **Thermal analysis of the Skylab airlock module.** R. L. Butin and M. B. Donovan (McDonnell Douglas Astronautics Co., St. Louis, Mo.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-40.* 10 p. 9 refs. Members, $1.00; nonmembers, $3.00.

Thermal design of the Skylab orbiting space station relied largely on mathematical analyses, and the Skylab airlock module performance in orbit builds confidence in the application of analytical methods to the design of complex space systems. The mathematical analyses were performed using the Airlock Thermal Model (ATOM), a computerized simulation of energy exchange between the major airlock module structure, atmospheric control system, ATM C&D Panel/EREP cooling system, EVA/IVA suit cooling systems, and the space radiator coolant system. Input parameters to the model include vehicle internal heat loads (compartment loads, electronic equipment waste heats and metabolic loads), system operating modes, vehicle configuration, and external orbital thermal radiation. Flight data are compared with the thermal predictions for a variety of flight conditions. Problem areas are discussed and recommendations made for future space systems thermal modeling. (Author)

A74-39139 # **Shuttle active thermal control system development testing.** M. L. Fleming, H. R. Howell, J. B. Dietz, and M. W. Reed (LTV Aerospace Corp., Vought Systems Div., Dallas, Tex.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-43.* 11 p. Members, $1.00; nonmembers, $3.00.

A series of system development tests were conducted on potential Shuttle active thermal control systems. Included in this testing were tests of systems composed of several flow arrangements of eight radiator panels of a modular design. Also included were tests of systems composed of the eight radiator panels operating in combination with an evaporative heat sink. In addition, coatings evaluation testings of a vapor-deposited-silver on Teflon coating was conducted to determine the adhesion capabilities of eight candidate adhesives under space simulated conditions and operational thermal cycles. The test articles and systems for these three tests are described and the test planning and objectives discussed. A summary of the significant results of the testing is presented. (Author)

A74-39140 # **Fan source noise control in environmental systems.** B. Magliozzi and F. B. Metzgar (United Aircraft Corp., Hamilton Standard Div., Windsor Locks, Conn.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-45.* 10 p. 21 refs. Members, $1.00; nonmembers, $3.00.

The fan noise of spacecraft life-support systems has been recognized as a serious problem in achieving a good working environment in extended space missions. On ships and submarines, the noise of fans in ventilation systems is a problem. Also, control of fan noise is a requirement in environmental systems of recent wide body transport aircraft to achieve acceptable noise environments outside the aircraft. This paper describes noise control features for spacecraft and aircraft environmental control systems and summarizes the results of experimental and analytical investigations of the sources of noise in fans used for environmental and life-support systems. Guidelines for low noise designs are discussed. (Author)

A74-39141 * # **Carbon wastewater treatment process.** M. F. Humphrey, G. M. Simmons, and W. L. Dowler (California Institute of Technology, Jet Propulsion Laboratory, Solid Propellant Engineering Section, Pasadena, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-46.* 11 p. 7 refs. Members, $1.00; nonmembers, $3.00. Contract No. NAS7-100.

A new powdered-carbon treatment process is being developed for the elimination of the present problems, associated with the disposal of biologically active sewage waste solids, and with water reuse. This counter-current flow process produces an activated carbon, which is obtained from the pyrolysis of the sewage solids, and utilizes this material to remove the adulterating materials from the water. Additional advantages of the process are the elimination of odors, the removal of heavy metals, and the potential for energy conservation. (Author)

A74-39142 * # **Silver ion bactericide system.** W. J. Jasionowski and E. T. Allen (Chemtric, Inc., Rosemont, Ill.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-49.* 11 p. 9 refs. Members, $1.00; nonmembers, $3.00. Contracts No. NAS9-12104; No. NAS9-12792; No. NAS9-13718.

Description of a preliminary flight prototype system which uses silver ions as the bactericide to preserve sterility of the water used for human consumption and hygiene in the Space Shuttle Orbiter. The performance of silver halide columns for passively dosing fuel cell water with silver ions is evaluated. Tests under simulated Orbiter mission conditions show that silver ion doses of 0.05 ppm are bactericidal for Pseudomonas aeruginosa and Type IIIa, the two bacteria found in Apollo potable water systems. The design of the Advance Prototype Silver Ion Water Bactericide System now under development is discussed. V.Z.

A74-39143 * # **Environmental control system development for manned spacecraft - 1960-1973.** D. C. Popma (NASA, Integrated Life Support and Protective Systems, Washington, D.C.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-50.* 14 p. 67 refs. Members, $1.00; nonmembers, $3.00.

This paper provides an overview of the development of environmental revitalization techniques from their beginnings in caisson and submarine habitats, up to the present time. The use of CO2 adsorbents, such as LiOH and their application to the first U.S. manned spaceflight is described, together with the beginnings of the regenerable CO2 sorber technology using molecular sieves and its ultimate application to Skylab. The concepts and hardware systems used for atmospheric revitalization on all major U.S. ground-based manned tests is detailed, including CO2 reduction and O2 generation processes. Current research and development efforts are also outlined. The paper concludes with a detailed description of the recently completed SSP, the most advanced and complete ECS that has been fabricated to date. (Author)

A74-39144 * # **Design, fabrication and acceptance testing of a zero gravity whole body shower.** E. A. Schumacher and J. A. Lenda (Martin Marietta Aerospace, Denver, Colo.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-51.* 11 p. Members, $1.00; nonmembers, $3.00. Contract No. NAS1-11339.

Recent research and development programs have established the ability of the zero gravity whole body shower to maintain a comfortable environment in which the crewman can safely cleanse and dry the body. The purpose of this program was to further advance the technology of whole body bathing and to demonstrate technological readiness including in-flight maintenance by component replacement for flight applications. Three task efforts of this program are discussed. Conceptual designs and system tradeoffs were accomplished in task 1. Task 2 involved the formulation of preliminary and final designs for the shower, while task 3 included the fabrication and test of the shower assembly. Particular attention is paid to the evaluation and correction of test anomalies during the final phase of the program. (Author)

A74-39145 * # **The Representative Shuttle Environmental Control System.** H. F. Brose, F. H. Greenwood (United Aircraft

Corp., Hamilton Standard Div., Windsor Locks, Conn.), C. D. Thompson, and N. C. Willis (NASA, Johnson Space Center, Houston, Tex.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-52.* 14 p. 10 refs. Members, $1.00; nonmembers, $3.00. Contract No. NAS9-13307.

The Representative Shuttle Environmental Control System (RSECS) program was conceived to provide NASA with a prototype system representative of the Shuttle Environmental Control System (ECS). Discussed are the RSECS program objectives, predicated on updating and adding to the early system as required to retain its usefulness during the Shuttle ECS development and qualification effort. Ultimately, RSECS will be replaced with a flight-designed system using either refurbished development or qualification equipment to provide NASA with a flight simulation capability during the Shuttle missions. The RSECS air revitalization subsystem and the waste management support subsystem are being tested. A water coolant subsystem and a freon coolant subsystem are in the development and planning phases. (Author)

A74-39146 # Electrokinetic effects in electrochemical cells - Hydrogen depolarized CO2 concentrator. J. R. Aylward (United Aircraft Corp., Hamilton Standard Div., Windsor Locks, Conn.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-53.* 8 p. Members, $1.00; nonmembers, $3.00.

Electrokinetic phenomena, i.e., electro-osmosis and electrophoresis, play an important role in the operation of electrochemical cells constructed of electrodes and/or matrix-electrolyte having a high interfacial area. The basic theory of operation of an electrochemical CO2 concentrator is presented emphasizing the effects electrokinetic phenomena on cell power, CO2 transfer efficiency, and matrix-electrolyte resistance. (Author)

A74-39147 * # An automated water iodinating subsystem for manned space flight. O. K. Houck (NASA, Johnson Space Center, Houston, Tex.) and R. A. Wynveen (Life Systems, Inc., Cleveland, Ohio). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-54.* 11 p. 11 refs. Members, $1.00; nonmembers, $3.00.

Controlling microbial growth by injecting iodine (I2) into water supplies is a widely acceptable technique, but requires a specialized injection method for space flight. An electrochemical I2 injection method and I2 level monitor are discussed in this paper, which also describe iodination practices previously used in the manned space program and major I2 biocidal characteristics. The development and design of the injector and monitor are described, and results of subsequent experiments are presented. Also presented are expected vehicle penalties for utilizing the I2 injector in certain space missions, especially the Space Shuttle, and possible injector failure modes and their criticality. (Author)

A74-39148 # Bosch CO2 reduction unit power studies. B. F. North and R. F. Holmes (General Dynamics Corp., Convair Aerospace Div., San Diego, Calif.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-55.* 8 p. Members, $1.00; nonmembers, $3.00.

Research and development work by Convair on a Bosch reduction unit has been in progress for several years. This concept, using a replaceable catalyst cartridge, has been successfully demonstrated in past programs. The current effort is to minimize power by reduction in recycle compressor power and by reducing heat losses through improved insulating techniques. Compressor and motor testing have provided data indicating the potential for substantial power reduction. Thermodynamic data are being obtained for comprehensive heat-transfer analysis. (Author)

A74-39149 # HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft. J. Lovell (United Aircraft Corp., Hamilton Standard Div., Windsor Locks, Conn.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-57.* 13 p. 6 refs. Members, $1.00; nonmembers, $3.00.

HS-C is a regenerable solid amine material being developed (under NASA contract) to perform the functions of humidity control CO2 removal for a Space Shuttle type vehicle. Both small- and large-scale testing have shown this material to be competitive, especially for the longer Shuttle missions. However, it had been observed that HS-C evolved ammonia under certain conditions giving cause for concern. First, ammonia would contaminate the cabin atmosphere, and second, the material is degrading with time. It was because of these concerns that a program was undertaken to learn the nature and rate of the reactions involved. An extensive test program has shown HS-C to produce only trace quantities of atmospheric contaminants and, under normal extremes, to have acceptable life. (Author)

A74-39150 * # Space station prototype Sabatier reactor design verification testing. R. J. Cusick (NASA, Johnson Space Center, Houston, Tex.). *SAE, AIAA, ASME, ASMA, and AIChE, Intersociety Conference on Environmental Systems, Seattle, Wash., July 29-Aug. 1, 1974, ASME Paper 74-ENAs-58.* 15 p. Members, $1.00; nonmembers, $3.00.

A six-man, flight prototype carbon dioxide reduction subsystem for the SSP ETC/LSS (Space Station Prototype Environmental/Thermal Control and Life Support System) was developed and fabricated for the NASA-Johnson Space Center between February 1971 and October 1973. Component design verification testing was conducted on the Sabatier reactor covering design and off-design conditions as part of this development program. The reactor was designed to convert a minimum of 98 per cent hydrogen to water and methane for both six-man and two-man reactant flow conditions. Important design features of the reactor and test conditions are described. Reactor test results are presented that show design goals were achieved and off-design performance was stable. (Author)

A74-39208 Estimation of phasic intra-ventricular volume by electromagnetic induction. D. A. Silage, F. D. Ketterer, and A. Noordergraaf (Pennsylvania, University, Philadelphia, Pa.). In: Advances in test measurement; Proceedings of the Twentieth International Instrumentation Symposium, Albuquerque, N. Mex., May 21-23, 1974. Volume 11. (A74-39177 19-14) Pittsburgh, Pa., Instrument Society of America, 1974, p. 335-340. 6 refs. Grants No. PHS-5-T01-GM-00606; No. PHS-HL-10330-7.

Description of a technique which uses the infusion of aqueous submicron ferrite suspension and its electromagnetic induction effect for the determination of phasic intraventricular volumes. Basic in this technique is the measurement of voltage variations induced by a ferrite core in a solenoid coil. The technique was tested on dogs with promising results. V.Z.

A74-39244 * Conservation of Shannon's redundancy for proteins. L. L. Gatlin (California, University, Berkeley, Calif.). *Journal of Molecular Evolution*, vol. 3, no. 3, 1974, p. 189-208. 28 refs. Grant No. NGR-05-003-460.

Concepts of information theory are applied to examine various proteins in terms of their redundancy in natural originators such as animals and plants. The Monte Carlo method is used to derive information parameters for random protein sequences. Real protein sequence parameters are compared with the standard parameters of protein sequences having a specific length. The tendency of a chain to contain some amino acids more frequently than others and the tendency of a chain to contain certain amino acid pairs more frequently than other pairs are used as randomness measures of individual protein sequences. Non-periodic proteins are generally found to have random Shannon redundancies except in cases of constraints due to short chain length and genetic codes. Redundant characteristics of highly periodic proteins are discussed. A degree of periodicity parameter is derived. V.Z.

A74-39247 * **Comments on papers by Reichert and Wong.** L. L. Gatlin (California, University, Berkeley, Calif.). *Journal of Molecular Evolution*, vol. 3, no. 3, 1974, p. 233-238. 14 refs. Grant No. NGR-05-003-460.

Papers of Reichert and Wong (1971) and Reichert (1972) are referred to as erroneous in stating that in their work with cytochrome c sequences they demonstrated that vertebrates have achieved a higher organized genetic message with a higher fidelity in the DNA-to-protein information processing channel. Arguments are given to contest that statement. V.Z.

A74-39251 Tactile movement detection and discrimination following dorsal column lesions in monkeys. C. J. Vierck, Jr. (Florida, University; U.S. Veterans Administration Hospital, Gainesville, Fla.). *Experimental Brain Research*, vol. 20, July 31, 1974, p. 331-346. 90 refs. U.S. Veterans Administration Grant No. MRIS-9026; Grant No. NIH-NS-07261.

Two Macaca speciosa monkeys were trained to discriminate two forms of tactile stimulation to the legs or feet. Both stimuli were delivered by perpendicular contact of bristles to the skin, but in one case the bristles were stroked across the skin as the brush was removed, and on the other trials the brush was removed as it had been applied, with minimal movement of the bristles over the skin. This test of tactile movement detection revealed only slight, transient impairment following ipsilateral section of the dorsal spinal columns. In another experiment, three monkeys learned to discriminate proximal vs distal movement of the bristles over the hairy skin of either leg. Dorsal column lesions in these monkeys produced an unusually enduring inability to discriminate direction of tactile stimulus motion. F.R.L.

A74-39277 # **Biology and remote sensing from spacecraft.** J. C. Zadoks and H. D. Frinking (Landbouwhogeschool, Wageningen, Netherlands). In: Approaches to earth survey problems through use of space techniques; Proceedings of the Symposium, Konstanz, West Germany, May 23-25, 1973. Berlin, East Germany, Akademie-Verlag GmbH, 1974, p. 41-46. 28 refs.

The biological uses of satellite-generated imagery are discussed in general terms. The main fields of interest are ecology, including natural vegetation, oceanography, and pollution, and natural resources, including agriculture, range lands, forestry, and fisheries. In the technical area of data collection, transmission, and storage, there is little to be desired, except better resolution. In the scientific area, there is much to be desired, especially with regard to the understanding of the interaction between living matter and radiation. New approaches are needed in teaching. Real progress will only be made when training in the application of remote sensing is offered, tailored to the biologist's needs. P.T.H.

A74-39278 # **Use of remote sensing in the study of Antarctic marine resources.** S. Z. El-Sayed and K. A. Green (Texas A & M University, College Station, Tex.). In: Approaches to earth survey problems through use of space techniques; Proceedings of the Symposium, Konstanz, West Germany, May 23-25, 1973. East Germany, Akademie-Verlag GmbH, 1974, p. 47-63. 22 refs. NSF Grant No. GV-36215X.

The krill is a valuable Antarctic marine resource which will some day be commercially exploited as a food source. The physical, chemical, and biological milieu of the Antarctic seas in which the krill is found is described generally in terms of pack ice distribution, light variations, cloud cover, physical oceanography, the distribution of nutrient salts, and phytoplankton and zooplankton population. The distribution of krill is discussed, and the extent, color, location and other features of krill swarms which may render them susceptible to remote sensing are indicated. Technique for the remote sensing of chlorophyll and sea temperature are available, but a technique for detecting krill swarms is not yet developed, though studies are in progress. P.T.H.

A74-39279 # **Remote sensing of Antarctic biological resources - Vertebrates.** D. B. Siniff and V. B. Kuechle (Minnesota, University, St. Paul, Minn.). In: Approaches to earth survey problems through use of space techniques; Proceedings of the Symposium, Konstanz, West Germany, May 23-25, 1973. Berlin, East Germany, Akademie-Verlag GmbH, 1974, p. 65-74. 11 refs.

The present work considers the application of aerial or satellite sensing in the assessment of the visible vertebrate populations of Antarctica (i.e., seals and penguins). The current hardware and resolutions which are required for identification of various animal concentrations are discussed. Guidelines concerning type of instrumentation are proposed, and the possibility of using floating platforms or remote land stations which can communicate to satellites passing overhead is discussed. P.T.H.

A74-39374 Behavioral and neurochemical alterations induced by hypoxia in rats. G. F. Koob and Z. Annau (Johns Hopkins University, Baltimore, Md.). *American Journal of Physiology*, vol. 227, July 1974, p. 73-78. 36 refs. Grants No. PHS-HL-10342; No. PHS-HL-05453; No. PHS-ES-00454; No. NIH-DA-00266.

A74-39375 Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia. A. L. Mark, F. M. Abboud, D. D. Heistad, P. G. Schmid, and U. J. Johannsen (Iowa, University; U.S. Veterans Administration Hospital, Iowa City, Iowa). *American Journal of Physiology*, vol. 227, July 1974, p. 178-182. 20 refs. Research supported by the U.S. Veterans Administration and American Heart Association; Grants No. NIH-HL-16149; No. NIH-HL-02644; No. NIH-HL-14388.

Intracoronary administration of nicotine or veratridine activates the Bezold-Jarisch reflex and produces reflex hypotension and vasodilatation. Experiments were performed to determine if local coronary and myocardial hypoxia and hypercapnia produce reflex vascular responses in skeletal muscle and skin in dogs with systemic normoxia and normocapnia. The results indicate that the Bezold-Jarisch or coronary chemoreflex is not activated by hypoxia and hypercapnia and suggest that distal coronary vessels and myocardium do not contain receptors which have the physiologic characteristics of arterial chemoreceptors. F.R.L.

A74-39380 Plasma cell surface antigen on human blood lymphocytes. N. S. Harris (Shriners Burns Institute, Galveston, Tex.). *Nature*, vol. 250, Aug. 9, 1974, p. 507-509. 15 refs. Research supported by the Shriners Burns Institute.

A long term culture of human plasma cells was established from a localized plasmacytoma tumor of a patient with multiple myeloma. The cultured cells morphologically resembled plasma cells, and they secreted an IgG immunoglobulin antigenically identical to the patient's myeloma protein. Using cells from this source, an antihuman plasma cell serum has been prepared which recognizes a surface antigen on human plasma cells. Studies conducted indicate that an antihuman plasma cell serum prepared against cultured human neoplastic plasma cells seems to have antibody activity against some normal human blood lymphocytes. G.R.

A74-39414 # **Characteristic biological sensors (Jellegzetes biologiai erzekelok).** L. Hajdu (Medicor Muvek Kutato es Fejleszto Intezet, Hungary). *Finommechanika - Mikrotechnika*, vol. 13, June 1974, p. 187-191. 6 refs. In Hungarian.

Consideration of the role of sensors used in medical practice for observing biological phenomena occurring in living organisms. The general requirements on such sensors are reviewed, as well as the problems of conducting biological signals of electrical nature. Among the most characteristic representatives of such sensors are EKG electrodes. Results obtained in Hungary in the field of research and developemnt of EKG electrodes suitable for long-term observations are discussed, as well as a characteristic solution for converting

nonelectrical biological signals (phenomena) into electrical quantities during the measurement of respiration frequency. A.B.K.

A74-39465 # Legged locomotion robots - Mathematical models, control algorithms and realizations. M. Vukobratovic (Michailo Pupin Institute for Automation and Telecommunications, Belgrade, Yugoslavia). *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 103 p. 31 refs.

Various approaches to the construction of mathematical models of legged locomotive automatic systems are explored. Expressions are given to describe the disengagement and swing phase of leg motion, and various phases of trunk motion. Synergy, synthesis and dynamics of anthropomorphic locomotive systems are discussed. Gait stability control algorithms are developed and their properties are evaluated. Requirements for approximately ideal stable locomotion of a biped machine are defined. The state of the art of locomotion robot realization is reviewed. V.Z.

A74-39469 # Control by generalized visual images. S. S. Kuprianov, B. N. Bradinov, and T. F. Proichev (Vissh Mashinno-Elektrotekhnicheski Institut, Sofia, Bulgaria). *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 12 p. 5 refs.

The efficiency of complex systems controlled by a human operator depends on the organisation of the man-system relations. This paper suggests a new type of organisation of those relations, effected by using a generalized visual image of the system state, through which the human operator gets information on the system's state and gives control commands. (Author)

A74-39505 # A transfer function approach to human operator skill development. D. R. Towill (University of Wales Institute of Science and Technology, Cardiff, Wales). *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 6 p. 14 refs.

A new application of transfer function models to the acquisition of skill in human operators is described. Least squares error nonrecursive parameter estimation, Kalman filter parameter estimation, and the impulse moment method are reviewed. If the model parameters are estimated on-line during the improvement phase, faulty designs and bad operators can be spotted early and eliminated. Skills which are amenable to this kind of modelling include the performance of tracking tasks such as submarine steering. J.K.K.

A74-39507 # Simulation by digital computer of walking machine control system. M. Petternella and S. Salinari (Roma, Università, Rome, Italy). *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 15 p. Research supported by the Consiglio Nazionale delle Ricerche.

Simulation of the control system for a six-legged walking machine is described. A multilevel control system was devised with the upper levels choosing the pace and coordinating the relevant parameters and the lower levels generating the laws of motion which establish the interconnections between the servomechanisms. Thus the motion of each support is adapted to the ground, and disturbances resulting from interaction of the supports through the body of the vehicle itself are reduced. The slow speed of the vehicle obviates the need for elastic suspension. J.K.K.

A74-39509 # Control of a multi-legged vehicle. W. T. Park and K. A. Fegley (Pennsylvania, University, Philadelphia, Pa.). *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 17 p. 15 refs.

A method of controlling vehicles which use mechanical legs for locomotion is described. A human operator sets the desired velocity, direction, or rate of turn, and the ideal linear and angular acceleration vectors to be achieved by vehicle leg action are then determined. The vehicles legs are operated in two different modes, a position mode and a force mode. The vehicle itself and its linear programming algorithm are described in some detail. A four-legged simulated model of the vehicle demonstrated its agility and stability in climbing up a flight of stairs. J.K.K.

A74-39510 # The multi-moded remote manipulator system. J. L. Nevins, T. B. Sheridan, D. E. Whitney, and A. E. Woodin. *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 39 p. 28 refs.

Review of problems and trends characteristic of the present state of the art in teleoperator design and of general-purpose cybernetic machines, in general. So far, no integrated man-supervised but computer-controlled systems have been built. In order to investigate many of the questions that arise in their design, it is necessary to build and use laboratory systems where the man-machine interactions can be discovered and the crucial hardware evaluations made, because the way a mechanical hand or a touch or vision sensor reacts to actual objects in real environments cannot be reliably predicted. Man and machine will play mutually supportive roles. The machine will keep the human operator from fatigue, errors, contamination, and danger, while the human operator will use his superior brain and sensor integration skills to guide the machine and help it out of jams by controlling it manually. M.V.E.

A74-39521 # Control algorithm of the walker climbing over obstacles. D. E. Okhotsimskii and A. K. Platonov. *IFAC, IIC, and ANIPLA, Symposium on Automatic Control in Space, 5th, Genoa, Italy, June 4-8, 1973, Paper.* 23 p.

Conceptual considerations are given for the synthesis of an algorithm for controlling the motion of a computerized six-leg walking rover. The algorithm should provide the rover with the capability of walking on rough terrains and over isolated obstacles. Several walking rover designs are considered, covering leg designs and coordination, various walk gaits, body structures, walking tracks, and standing position sequences. V.Z.

A74-39626 Cardiac mechanics: Physiological, clinical, and mathematical considerations. Edited by I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.), D. N. Ghista (Indian Institute of Technology, Madras, India), and H. Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field; Stanford University, Palo Alto, Calif.). New York, John Wiley and Sons, Inc., 1974. 496 p. $24.

Recent studies concerning the basic physiological and biochemical principles underlying cardiac muscle contraction, methods for the assessment of cardiac function in the clinical situation, and mathematical approaches to cardiac mechanics are presented. Some of the topics covered include: cardiac ultrastructure and function in the normal and failing heart, myocardial energetics, clinical applications of angiocardiography, use of echocardiography for evaluating cardiac performance, systolic time intervals in the noninvasive assessment of left ventricular performance in man, evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle, a conceptual model of myocardial infarction and cardiogenic shock, application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle, and a rheological modeling of the intact left ventricle.

Individual items are announced in this issue. P.T.H.

A74-39627 Basic terminology and formulae for left ventricular wall stress. I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 3-10. 11 refs. NIH-supported research.

A glossary of terms is presented for describing the stress behavior of the left ventricular wall. This includes terms such as elasticity, tension, stress, strain (Lagrangian strain and natural strain), Young's modulus, tangent modulus, pressure, isotropy, anisotropy, Poisson's ratio, nonhomogeneous material, incompressibility, creep,

stress relaxation, compliance, and contractility. Since the left ventricular wall geometry is usually approximated by a sphere or ellipsoid of revolution, two formulas are presented for wall stress - one for a spherical geometry and one for an elliptical geometry. P.T.H.

A74-39628 Cardiac ultrastructure and function in the normal and failing heart. R. A. Leyton (National Institutes of Health, National Heart and Lung Institute, Bethesda, Md.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 11-65. 176 refs.

First, the normal myocardium is described in terms of its ultrastructure. The described organelles and their component structures are correlated with functional activity. Then, ultrastructural alterations which appear in the diseased failing heart are detailed. The possible relation of these changes to the abnormal function of the failing heart is noted and assessed. It is pointed out, however, that in some cases, pathological abnormalities may not initially yield any overt structural change. P.T.H.

A74-39629 Biochemical basis for cardiac contraction. A. M. Katz (New York, City University, New York, N.Y.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 67-86. 25 refs. Grants No. PHS-HL-13191; No. NIH-NHLI-72-2973-M.

The salient structural and biochemical aspects of the contractile proteins of the myocardium are described. This includes the following proteins: myosin, actin, tropomyosin, troponin I, troponin C, and troponin T. An attempt is made to relate the interactions between these proteins to their expression in the living heart as specific mechanical properties. The means by which excitation-contraction coupling leads to the initiation of myocardial contraction are described. Finally, certain recent findings that define possible mechanisms by which physiological and pharmacological interventions can modulate excitation-contraction coupling to bring changes in myocardial contractility are described. P.T.H.

A74-39630 Force-velocity studies in isolated and intact heart muscle. I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.) and W. W. Parmley (Cedars-Sinai Medical Center; California, University, Los Angeles, Calif.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 87-112. 35 refs. Grant No. NIH-HL-12711-04.

The present work considers the Voigt and Maxwell three-element models for describing the mechanical behavior of the cardiac muscle. The force-velocity analyses for both isolated and intact heart muscle are reviewed, and the stress strain relations are elucidated for the series elastic element. A theoretical analysis is set forth for the determination of the contractile element force-velocity relations based on both the Maxwell and Voigt models. Some experimental studies are discussed in detail for the development of force-velocity parameters that may be employed for assessing muscle function. P.T.H.

A74-39631 Myocardial energetics. C. L. Skelton and E. H. Sonnenblick (Harvard University; Peter Bent Brigham Hospital, Boston, Mass.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 113-137. 77 refs. Research supported by the American Heart Association; Grants No. NIH-HE-11306-04; No. NIH-1T1-HE-5890-01.

The present work discusses the major determinants of myocardial energy utilization (MVO2): (1) myocardial stress (internal work), which in turn is determined by ventricular pressure, intraventricular volume, and myocardial mass; (2) the contractile state of the heart as characterized by the force-velocity relation; and (3) heart rate, which determines the number of times per minute the heart is activated. Although precise measurements of myocardial stress and contractile state require the utilization of sophisticated angiographic techniques, a reasonable estimate of the determinants of MVO2 in a given patient can be obtained from the product of heart rate and systolic blood pressure. Knowledge of these general principles should provide a rational framework for understanding the dynamic control of myocardial oxygen consumption in both normal and pathological states such as congestive heart failure and myocardial ischemia and infarction. P.T.H.

A74-39632 * Angiocardiographic methods for determination of left ventricular geometry and volume. H. Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field; Stanford University, Palo Alto, Calif.) and H. T. Dodge (Washington, University, Seattle, Wash.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 141-170. 62 refs.

Methods are described for calculating left ventricular (LV) dimensions and chamber volumes from radiographic films. The use of biplane films for the calculation of LV volume and volume change is based on the assumption of an ellipsoidal geometry. Calculation of LV volumes from biplane films usually overestimated known volumes in postmortem hearts regardless of the methods used for volume calculation. The reasons for this are probably best explained by the fact that a smooth-surface ellipse is used to represent the irregular cavity of the LV chamber. LV volume calculated from data in a single plane compared favorably and closely with volumes calculated from biplane films. A table of normal values of ventricular volume established by angiographic studies is presented. P.T.H.

A74-39633 * Clinical applications of angiocardiography. H. T. Dodge (Washington, University, Seattle, Wash.) and H. Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field; Stanford University, Palo Alto, Calif.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 171-201. 87 refs. Grant No. NIH-HL-13517-02.

Several tables are presented giving left ventricular (LV) data for normal patients and patients with heart disease of varied etiologies, pointing out the salient features. Graphs showing LV pressure-volume relationships (compliance) are presented and discussed. The method developed by Rackley et al. (1964) for determining left ventricular mass in man is described, and limitations to the method are discussed. Some clinical methods for determining LV oxygen consumption are briefly described, and the relation of various abnormalities of ventricular performance to coronary artery disease and ischemic heart disease is characterized. P.T.H.

A74-39634 Use of echocardiography to evaluate cardiac performance. H. Feigenbaum (Indiana University Medical Center, Indianapolis, Ind.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 203-231. 41 refs. Research supported by the Herman C. Krannert Fund and Indiana Heart Association; Grants No. PHS-HE-09815-07; No. PHS-HE-6308; No. PHS-HTS-5363.

Implementation of the echocardiographic method for visualizing internal cardiac structures is described. The discussion is limited to one-dimensional scans, yielding one-dimensional 'ice-pick' views of the heart. Studies have shown that there is a good relationship between echocardiographic measurements and left ventricular volumes. A formula is given for determining left ventricular volume from the ultrasound dimensions, assuming that the left ventricle is a prolate ellipsoid. Echocardiography also permits the assessment of segmental dysfunction of the left ventrical together with overall ventricular performance in the uniformly contracting ventricle. The analysis of mitral valve echograms is described, and its usefulness in evaluating left ventricular performance is discussed. P.T.H.

A74-39635 **Systolic time intervals in the noninvasive assessment of left ventricular performance in man.** W. S. Harris (University of Illinois Hospitals, Chicago, Ill.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 233-292. 203 refs. Research supported by the American Heart Association; Grants No. NIH-HL-14412-02; No. NIH-1-T12-HL-05879-04.

The present work discusses the techniques for the noninvasive recording and measurement of the systolic time intervals (STI) and their determinants and correlates. The principal method discussed is the simultaneous recording of the electrocardiogram, phonocardiogram, and carotid pulse tracing. Regression data and correction formulas are given for the correction of the STIs for heart rate. The effects of sex, age, diurnal variation, and exercise habits on STIs are discussed, and the effects of drugs, other interventions, and diseases are investigated. P.T.H.

A74-39636 **Clinical applications of force-velocity parameters and the concept of a 'normalized velocity'.** I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.), A. Pasternac (Montreal Heart Institute, Montreal, Canada), R. C. Ellison (Georgetown University Hospital, Washington, D.C.), and P. G. Hugenholtz (Erasmus Universiteit, Rotterdam, Netherlands). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 293-329. 43 refs. Grant No. NIH-HL-12711-04.

The experiment of Hugenholtz et al. (1970) is described, in which hemodynamic parameters were compared with the maximum contraction velocity and where it was shown that maximum velocity can be useful as an index of the contractile state in man. Subsequent studies are then described, which remedied some of the shortcomings of the methods of Hugenholtz et al. In these, it is shown that myocardial contractility can be assessed from ventricular pressure recordings alone, although the method is valid only for infants, children, and young adults. Recent studies in cineangiographic analysis are then reviewed, which is a technique appropriate for adults. Other hemodynamic indices of cardiac function discussed are left ventricular ejection velocity and a quantity obtained from displacement time tracing by the apexogram. P.T.H.

A74-39637 **Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle.** I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.) and W. W. Parmley (Cedars-Sinai Medical Center; California, University, Los Angeles, Calif.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 331-358. 38 refs. Grant No. NIH-HL-12711-04.

Methods are described for evaluating the elastic stiffness in isolated heart muscle, the intact dog heart, and the intact human heart, with the purpose of developing more sensitive indices for the detection of changes in the left ventricular wall stiffness. Elastic stiffnesses and stiffness constants were computed on the basis of the pressure-volume data obtained from the studies of Gaasch et al. (1972). These data are then discussed in relation to the presence of hypertrophy. P.T.H.

A74-39638 **A conceptual model of myocardial infarction and cardiogenic shock.** H. J. C. Swan, J. S. Forrester, K. Chatterjee, W. W. Parmley (Cedars-Sinai Medical Center; California, University, Los Angeles, Calif.), G. Diamond (St. Vincent's Hospital; California, University, Los Angeles, Calif.), and I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 359-377. 35 refs. Research supported by the United Hostesses; Grants No. NIH-PH-43-68-1333; No. NIH-SO1-RR-05468.

A theoretical model of acute myocardial infarction (AMI) is proposed for the understanding of the hemodynamic alterations accompanying cardiogenic shock and the variable response to drug therapy. The model takes into consideration infarct size, pressure and volume requirements for the maintenance of normal stroke volume and normal contractility, the relationship of compliance to ventricular performance, filling pressure, ventricular function curves and the contractile state, added mechanical load, and the temporal relationships of contractility, compliance, and cardiac dilatation. P.T.H.

A74-39639 **Review of various theories for the evaluation of left ventricular wall stresses.** I. Mirsky (Harvard University; Peter Bent Brigham Hospital; Children's Hospital Medical Center, Boston, Mass.). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 381-409. 29 refs. NIH-supported research.

Some analytical models are reviewed for the evaluation of the stress state in the left ventricle, including Laplace's theory, which is a thin-wall theory, and some thick-wall theories. Some recent theories are then considered which take into consideration the effect of fiber orientation, anisotropy, and nonhomogeneity. For the present, Laplace's law remains a useful tool for evaluating mean wall stresses. What is required is more sophisticated experimental studies for determining the effects of fiber orientation and anisotropy and for the accurate measurement of the three-dimensional ventricular geometry. P.T.H.

A74-39640 **Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle.** A. Y. K. Wong (Dalhousie University, Halifax, Nova Scotia, Canada). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 411-437. 45 refs. Research supported by the Nova Scotia Heart Foundation and Medical Research Council of Canada.

Consideration of Hill's three-component model for cardiac muscle incorporating Huxley's sliding-filament model for the contractile element. Mechanical activity in hypertrophied papillary muscle is simulated on the basis of this model. The rate of tension development was slower in hypertrophied than in normal muscle, and this was due to changes in contractile element property and calcium binding. At equal muscle length, less tension was developed in hypertrophied muscle. The norepinephrine-induced increase in peak tension was greater in hypertrophied muscle than in normal muscle. P.T.H.

A74-39641 **Rheological modeling of the intact left ventricle.** D. N. Ghista (Indian Institute of Technology, Madras, India). In: Cardiac mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 439-462.

A three-dimensional left ventricular model similar to that of Ghista and Sandler (1969) is considered. Stress-strain relations are formulated for this model which are equivalent to those for a one-dimensional system as represented by either a Voigt or a Maxwell model. An analytic procedure is presented to predict the in vivo PE, SE, and CE properties associated with the muscle element in terms of stress, strain, rate of strain, and time. Pressure-volume data were obtained from patients at the time of catheterization. By assuming various functional relationships between force and velocity, the parameters of the force-velocity relations are determined. An insight into the nonlinear rheological characteristics of the relaxed myocardium and the force-velocity behavior of the contractile unit of the myocardium is obtained. P.T.H.

A74-39642 * **Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations.** D. N. Ghista (Indian Institute of Technology, Madras, India) and H. Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field; Stanford University, Palo Alto, Calif.). In: Cardiac

mechanics: Physiological, clinical, and mathematical considerations. New York, John Wiley and Sons, Inc., 1974, p. 463-482. 22 refs.

An analytical method is presented for determining the oxygen consumption rate of the intact heart working (as opposed to empty but beating) human left ventricle. Use is made of experimental recordings obtained for the chamber pressure and the associated dimensions of the LV. LV dimensions are determined by cineangiocardiography, and the chamber pressure is obtained by means of fluid-filled catheters during retrograde or transeptal catheterization. An analytical method incorporating these data is then employed for the evaluation of the LV coronary oxygen consumption in five subjects. Oxygen consumption for these subjects was also obtained by the conventional clinical method in order to evaluate the reliability of the proposed method. P.T.H.

A74-39782 **A user-oriented program for crash dynamics.** R. N. Karnes, J. D. Sebastian, J. L. Tocher, and D. W. Twigg (Boeing Computer Services, Inc., Seattle, Wash.). In: *Finite element application to vehicle design; Proceedings of the International Conference on Vehicle Structural Mechanics, Detroit, Mich., March 26-28, 1974.* New York, Society of Automotive Engineers, Inc., 1974, p. 154-163. 8 refs. Contract No. N00014-72-C-0223.

This paper describes the conversion of a crash analysis program from its original batch program form with awkward input to an efficient, user-oriented interactive tool. The program simulates a vehicle occupant with a two dimensional, seven link mathematical model restrained by a seat belt and shoulder harness. A nonlinear finite element capability was added to enable modeling of a seat which would interact realistically with the occupant. A new differential equation solver was developed which achieved a sixty per cent reduction in the computer time required for the transient response analysis. The modified program incorporates user aids such as free-field data input and an on-line data edit capability. Output was reformatted to provide user-selected time history and occupant configuration plots as well as readable printout. (Author)

A74-39789 **Photographic analysis of human startle reaction to sonic booms.** R. I. Thackray, R. M. Touchstone, and J. P. Bailey (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 803-806. 5 refs.

A74-39790 * **Apollo space crew cardiovascular evaluations.** G. W. Hoffler, R. L. Johnson (NASA, Johnson Space Center, Biomedical Research Div., Houston, Tex.), and R. A. Wolthuis (Technology, Inc., Houston, Tex.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 807-820. 20 refs.

Cardiovascular responses associated with pre- and postflight orthostatic tolerance evaluations of Apollo crewmen are presented with a brief historical survey and a discussion of their implications for future manned space flight. Heart rates were increased while systolic and pulse pressures were decreased during the immediate postflight orthostatic evaluation. A postflight elevation in resting heart rate was a less frequent finding. M.V.E.

A74-39791 **Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat.** R. R. Wolfe and S. M. Horvath (California, University, Santa Barbara, Calif.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 821-823. 15 refs. Grant No. AF-AFOSR-73-2455.

A74-39792 * **Recovery of medically important microorganisms from Apollo astronauts.** G. R. Taylor (NASA, Johnson Space Center, Life Sciences Directorate, Houston, Tex.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 824-828. 23 refs.

Microbiological samples were obtained from the crewmembers of the Apollo 13, 14, 15, 16, and 17 spaceflights. These specimens were analyzed for the presence of medically important microorganisms with Staphylococcus aureus, Pseudomonas aeruginosa, Tricophyton mentagrophytes, Tricophyton rubrum, and Candida albicans being discussed in detail. Preflight isolation of crewmembers was found to coincide with a complete absence of inflight disease events and is recommended for future spaceflights. No autoinfection response (microbial shock) occurred after any of the reported spaceflights. (Author)

A74-39793 * **Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram.** T. B. Graboys, R. D. Lille, B. J. Polansky, and A. V. Chobanian (Boston University Medical Center, Boston, Mass.; USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 834-839. 28 refs. NASA-supported research; Grant No. PHS-RR-533. AF Project 7930-03-25.

A74-39794 * **Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice.** J. D. Gillmore and F. B. Gordon (National Naval Medical Center, Naval Medical Research Institute, Bethesda, Md.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 840-842. 12 refs. NASA-supported research. Navy Task M4306,01-1200-BCK9.

A74-39795 **Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/.** H. L. Johnson, C. F. Consolazio, R. F. Burk, and T. A. Daws (U.S. Army, Fitzsimons Army Medical Center, Denver, Colo.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 849-854. 18 refs.

The catabolism of infused C(14)-glucose in sea level natives was compared during initial altitude exposure and at sea level. An increased disappearance of plasma radioactive glucose at altitude was observed in both studies, and an increased production of C(14)O2 in the second study was observed. Fasting plasma glucose levels decreased with increased duration of altitude exposure. Altitude exposure enhanced glucagon-mediated hyperglycemia. A shorter duration of hyperglycemia and lower glucose levels at 50 min post-glucagon (below initial levels) would suggest a depletion of liver glycogen stores in the 40-hr exposed men. These data suggest that glucose catabolism was enhanced during the first few days at altitude with a concomitantly increased requirement for carbohydrate intakes, as noted in previous studies. (Author)

A74-39796 **Stability of the intracranial circulation in an altered gravitational field.** Iu. E. Moskalenko, G. B. Weinstein, B. B. Zelikson, T. I. Ivanova, and Iu. Ia. Kisliakov (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 860-863.

A74-39797 **Effect of prolonged stay at altitude /4000 m/ on autonomic balance.** M. S. Malhotra and L. Mathew (Defence Institute of Physiology and Allied Sciences, Delhi, India). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 869-872. 16 refs.

The effect of prolonged stay at altitude on sympathoparasympathetic changes was investigated on two groups of subjects: one just returned from altitude (4000 m) after staying there for two years, and the other consisting of sea level residents. The results suggest that there is selective hypertonus of the autonomic nervous system, some components favoring sympathetic overactivity while others showing predominance of the parasympathetic system, due to the effect of prolonged stay at altitude. M.V.E.

A74-39798 **Functional organization of the ocular motor system.** L. F. Dell'Osso and R. B. Daroff (Miami Veterans Administration Hospital; Miami, University, Miami, Fla.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 873-875. 20 refs.

Various stimuli, other than a moving target, have evoked slow eye movements improperly designated 'pursuit.' Attempts at explaining these eye movements have provoked convoluted hypotheses. This confusion can be alleviated by conceptualization of the ocular motor control system as a synergistic interaction of the dual-mode version subsystem with the vergence subsystem which produces only three basic outputs: fast eye movements, slow eye movements, and vergence eye movements. (Author)

A74-39799 **Glucose tolerance tests in rats exposed to varying altitude stress.** H. K. Das and N. C. Ghosh (Calcutta, University, Calcutta, India). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 876-878. 13 refs.

A74-39800 **Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/.** L. D. Star, L. C. Abelson, and A. S. Goldner (J. F. Kennedy International Airport, Medical Office, Jamaica, N.Y.). *Aerospace Medicine*, vol. 45, Aug. 1974, p. 888-892.

After the most recent revision to the Medical Emergency Plan at Kennedy International Airport a simulated disaster drill was held, known as Operation SAFE (Simulated Aircraft Fire and Emergency). Objectives of this exercise included evaluation of the newly acquired Port Authority Mobile Inflatable Treatment Unit as well as response and casualty care capabilities of medical teams from the Kennedy Medical Office and The Emergency Medical Services Division of the New York City Health and Hospitals Corp. Subsequent to the exercise an evaluation meeting was held. At this session each aspect of the performance was discussed. Recommendations were made to improve performances in various aspects of the plan. Operation SAFE illustrated that constant updating and revision of a medical emergency plan is necessary if casualties are to be adequately treated. (Author)

A74-39821 * **Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections.** J. F. Greenleaf, S. A. Johnson, S. L. Lee, E. H. Wood (Mayo Foundation, Rochester, Minn.), and G. T. Herman (New York, State University, Buffalo, N.Y.). In: International Symposium on Acoustical Holography and Imaging, 5th, Palo Alto, Calif., July 18-20, 1973, Proceedings. New York, Plenum Press, 1974, p. 591-603. 7 refs. Research supported by the American Heart Association; NSF Grant No. GT-998; Grants No. NIH-HL-4664; No. NIH-HL-3532; No. NIH-RR-7; No. NIH-HE-52076; Grant No. NGR-24-003-001.

A74-40022 **Modeling of human operator performance utilizing time series analysis.** S. M. Shinners (Sperry Rand Corp., Great Neck, N.Y.). *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-4, Sept. 1974, p. 446-458. 47 refs. USAF-supported research.

A new method for modeling the human operator from actual input-output data utilizing time series analysis is discussed. The technique first identifies the form of the model, then estimates the parameters of the identified model based on actual data. Finally it checks the fitted model in relation to the data with the aim of revealing model inadequacies, thus providing model improvement. The methodology for applying the time series technique for determining the model of the human element in a feedback system is discussed. In addition, an approach for determining the human model under various levels of stress is discussed. Since this is the first time that the human model has ever been obtained from the time series method, the results shed new light on certain aspects of this problem, reveal new insights into the human model, and ask other probing questions. (Author)

A74-40024 **Modes of control and the limits of control capability for human subjects.** H. Tamura (Osaka University, Toyonaka, Japan) and T. Yoshida (Matsue Technical College, Matsue, Japan). *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-4, Sept. 1974, p. 482-488. 8 refs.

The present work makes a comparative study of human control behavior in various control situations and classifies the behavior into several modes of control. It is shown that the mode of control adopted by the subject ultimately determines the limits of control capability for the person. A mode of control adopted by a subject in a particular situation depends on the order of the plant, the controller, and the training experience of the subject. Change in modes of control and of the limits of control capability is discussed from the viewpoint of information processing in the human operator. It is proposed that the model of the human operator should represent the human as an information processor rather than as an element of a control system represented by an input-output relation. P.T.H.

A74-40091 # **Effects of aircraft noise on man.** H.-O. Finke, R. Guski, R. Martin, B. Rohrmann, R. Schümer, and A. Schümer-Kohrs. In: Symposium on Noise in Transportation, Southampton, England, July 22, 23, 1974, Proceedings. Southampton, University of Southampton, 1974. 14 p. 13 refs.

Review of recent experimental investigations on possible psychological and/or physiological damage caused by aircraft noise based mainly on verbally mediated behavior of people living near airports or on observation of momentary effects of reproduced sounds on physiological or psychological processes in laboratories. Social surveys and interdisciplinary analyses of aircraft noise effects are also discussed, with special attention to methodological problems encountered. M.V.E.

A74-40114 **Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings.** Conference sponsored by the University of Nottingham, University of Birmingham, and International Fluidics Services. Edited by T. E. Brock and W. A. Thornton. Carlton, Beds., England, International Fluidics Services, Ltd., 1974. 410 p. $42.

The practical industrial applications of advanced automation and artificial intelligence are discussed. Research efforts directed at the cost-effective implementation of robot technology in concrete industrial situations is described. Problems in the design of devices for automatic-handling jobs with several degrees of freedom and sequential control are treated in detail, as are problems in optimizing sensory input to automatic devices, use of acoustic ranging, and automatic pattern recognition. Topics include the future of programmable assembly machines, long-term field experience with robots, design of manufacturing systems with robots, complicated sequential systems, rationalized sequence control, programmable standard hardware for automatic controls, pneumatic robot drives for continuous path control, precise insert operation, sensory motor control, mini-computers in robot control, robots as nuclear-reactor crews, applications of Versatran systems, economic systems analysis, welding and spraying robots, and many other actual and proposed robot types, systems, and applications.

Individual items are announced in this issue. J.K.K.

A74-40115 **The right robot for the right job.** R. S. Mosher and C. R. Benson (Robotics, Inc., Elnora, N.Y.). In: Conference on Industrial Robot Technology, 2nd, Birmingham, England, March 27-29, 1974, Proceedings. Carlton, Beds., England, International Fluidics Services, Ltd., 1974, p. A5-53 to A5-68. 13 refs.

Successful use of robots depends on choosing the machine and control types best suited for a particular type of work process. Load, speed, range of motion, dexterity, control quality, program memory capacity, and robot-to-process line control logic are salient operating characters that must be defined as guidelines for the selection of the proper robot system. The end effector (or mechanical hand) design is a very significant factor in successful robot application. (Author)

A74-40116 **Precise insert operation by tactile controlled robot.** T. Goto, T. Inoyama, and K. Takeyasu (Hitachi, Ltd., Central Research Laboratory, Tokyo, Japan). In: Conference on Industrial Robot Technology, 2nd, Birmingham, England, March 27-29, 1974, Proceedings. Carlton, Beds., England, International Fluidics Services, Ltd., 1974, p. C1-1 to C1-8.

A tactile controlled robot, 'HI-T-HAND' Expert 1 with a flexible wrist and delicate feeling that inserts pistons in cylinders with a clearance of about 20 microns faster and more deftly than human hands has been developed. Such operations requiring precision in microns have been considered beyond the ability of conventional industrial robots or automatic assembling machines.

Also, only skilled workers can now do such operations, since they call for a delicate touch rather than eyesight. The 'HI-T-HAND' Expert 1 has been designed to provide the delicate touch comparable to the human hand, necessary for such inserting operations. It is composed of a main robot with three-directional freedom of motion, an auxiliary robot with two-degrees-of-freedom parts supply equipment, and a sequence control device. In the inserting operation, the hands of the main and auxiliary robots pick up a cylinder and a piston, respectively, and seek out the position of the hole in the cylinder. Next, the position of the piston relative to the hole is fitted, and corrections are made in the inserting direction to prevent locking. (Author)

A74-40117 Telemanipulators - A facility for conquering space by man. K. M. Droge and H. Kleinwachter (Kleinwachter Entwicklungs und Forschungslabor, Baden, West Germany). In: Conference on Industrial Robot Technology, 2nd, Birmingham, England, March 27-29, 1974, Proceedings.
Carlton, Beds., England, International Fluidics Services, Ltd., 1974, p. D2-13 to D2-20.

Description of the basic mode of operation of the telemanipulators Syntelmann and Schiwa and their application in space and nuclear environments. The most important component of the information transmission system is a two-eyed stereo TV system. (Author)

A74-40118 VIRGULE - A rescue vehicle of the new teleoperator generation. J. Vertut (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Saclay, Gif-sur-Yvette, Essonne, France). In: Conference on Industrial Robot Technology, 2nd, Birmingham, England, March 27-29, 1974, Proceedings.
Carlton, Beds., England, International Fluidics Services, Ltd., 1974, p. D3-21, D3-23 to D3-38.

VIRGULE is a radio-controlled rescue vehicle capable of operating over rough terrain either indoors or outdoors. The VIRGULE developmental program offers many applications. In addition to the operational vehicle slated for 1975, it has a new conventional telemanipulator for hot laboratories, as well as many advanced state-of-the-art developments for reliability. It features efficient drive of a radio-guided, TV-equipped vehicle over obstacle-prone or rough terrain, efficient master-slave telemanipulators following various methods of control, improvement of the latter methods through the servo loop, and improvement to mechanical terminal elements (tongs with several fingers coming close to being a hand). F.R.L.

A74-40126 The effect of masker duration on forward and backward masking. M. J. Penner (USAF, Human Resources Laboratory, Williams AFB, Chandler, Ariz.), E. Cudahy, and G. W. Jenkins (Arizona State University, Tempe, Ariz.). *Perception and Psychophysics*, vol. 15, June 1974, p. 405-410. 14 refs. NIH-USAF-supported research.

Temporal masking of clicks by noise was investigated using forward and backward masking paradigms. Both the noise duration and the temporal separation between the click and noise were varied. For very brief temporal separations (100 microsec) and for very long temporal separations (100 msec), the duration of the masker did not greatly affect the click threshold. However, for intermediate temporal separations (3 msec), the threshold increased by as much as 44 dB as the noise duration increased from 0.1 to 100 msec. Temporal weighting functions, which describe the relative effectiveness of the noise as a function of temporal separation, were computed from these data. (Author)

A74-40127 Judgments about the duration of brief stimuli. L. G. Allan and A. B. Kristofferson (McMaster University, Hamilton, Ontario, Canada). *Perception and Psychophysics*, vol. 15, June 1974, p. 434-440. 8 refs. National Research Council of Canada Grants No. A-8260; No. A-7919.

Visual duration discrimination data for durations between 70 and 1020 msec are presented. A model for duration discrimination proposed by Allan et al. (1972) is elaborated, and the data are discussed in terms of the model. The data are in agreement with the basic assumptions of the model. Differences between these data and duration discrimination data presented by others are discussed. (Author)

A74-40128 Repetition effects in choice reaction time to multidimensional stimuli. G. L. Felfoldy (Yale University, New Haven, Conn.). *Perception and Psychophysics*, vol. 15, June 1974, p. 453-459. 17 refs. Grant No. PHS-MH-14229.

The study reported is designed to approximate the card-sorting task as closely as possible, while permitting measures of discrete reaction times within the stimulus sequence. This makes it possible to relate the growing body of research on sequential effects to the study of the perceived structure of multidimensional stimuli. Two stimulus dimensions are manipulated in order to investigate the effects of variation in one dimension upon the processing of the other dimension. The results of the study indicate that the stimulus dimensions of height and width of rectangles are not processed independently of one another. G.R.

A74-40129 Can attention be allocated to sensory modalities. R. M. Shiffrin and D. W. Grantham (Indiana University, Bloomington, Ind.). *Perception and Psychophysics*, vol. 15, June 1974, p. 460-474. 39 refs. Grant No. PHS-12717-06.

Three experiments examined the effects of attention allocation to the modalities of vision, audition, and touch. The first two experiments utilized a simultaneous-successive comparison. The simultaneous procedure involved simultaneous monitoring of all three sensory modalities for the presence of a near-threshold stimulus. The successive condition allowed the subject to give his full attention to each sensory modality in turn. There was no advantage for the successive condition, whether the task consisted of detection of a single stimulus (experiment I) or detection of the absence of one of many stimuli (experiment II). Experiment III used a different paradigm to extend these results and bridge the gap between these results, those of Eijkman and Vendrik (1965), and those of Moray (1973). It is concluded that selective allocation of attention to sensory modalities does not affect the early stages of perceptual processing. (Author)

A74-40130 Proximal velocity change as a determinant of space perception. C. von Hofsten (Uppsala, Universitet, Uppsala, Sweden). *Perception and Psychophysics*, vol. 15, June 1974, p. 488-494. 14 refs. Research supported by the Swedish Council for Social Sciences Research and Tricentennial Fund of the Bank of Sweden.

The manner in which and the degree to which proximal velocity change determines perceived translatory motion in depth was studied with a stimulus consisting of a single dot moving in a straight horizontal path in a frontoparallel plane. Its motion corresponded to distal depth motion with constant speed. Subjects reported verbally what they perceived. The results show that proximal velocity changes of this kind are, within certain limits, utilized by the visual system for the perception of translatory motion in depth. The limits were found to be determined by the absolute rate of change in proximal velocity. Further, it was found that the perceived motion track was usually bent, although all stimuli simulated depth motions along straight paths. (Author)

A74-40131 Fragmentation and identifiability of repeatedly presented brief visual stimuli. R. M. Johnson and J. J. Uhlarik (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.). *Perception and Psychophysics*, vol. 15, June 1974, p. 533-538. 17 refs. Research supported by the Kansas State University of Agriculture and Applied Science; Grant No. PHS-MH-20862-01A1.

Subjects were given repeated brief presentations of geometric forms and drew what they thought they saw. The stimulus patterns were presented tachistoscopically for as many repetitions as necessary for correct identification. The nature and sequential properties of pattern fragments reported prior to correct identification were examined. The first fragments to be reported were generally straight line elements of the stimulus patterns. With repeated presentations, more features were gradually reported until the complete figure was correctly identified. The pattern of construction appeared similar to patterns of fragmentation found in research on stabilized retinal images, prolonged afterimages, and conditions of steady fixation. Implications of these findings for theories of pattern information processing were discussed. (Author)

A74-40132 * The effect of a visual indicator on rate of visual search - Evidence for processing control. J. E. Holmgren (Maryland, University, College Park, Md.). *Perception and Psychophysics,* vol. 15, June 1974, p. 544-550. 8 refs. Grant No. NGR-05-020-244.

Search rates were estimated from response latencies in a visual search task of the type used by Atkinson et al. (1969), in which a subject searches a small set of letters to determine the presence or absence of a predesignated target. Half of the visual displays contained a marker above one of the letters. The marked letter was the only one that had to be checked to determine whether or not the display contained the target. The presence of a marker in a display significantly increased the estimated rate of search, but the data clearly indicated that subjects did not restrict processing to the marked item. Letters in the vicinity of the marker were also processed. These results were interpreted as showing that subjects are able to exercise some degree of control over the search process in this type of task. (Author)

A74-40133 Binocular brightness combinations - Additive and nonadditive aspects. Ch. M. M. de Weert and W. J. M. Levelt (Nijmegen, Katholieke Universiteit, Nijmegen, Netherlands). *Perception and Psychophysics,* vol. 15, June 1974, p. 551-562. 24 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek.

A conjoint measurement procedure is used for the measurement of binocular brightness as a function of left and right luminance inputs. For nonzero stimulation, the data confirm earlier findings: the system can be described as additive with a scale exponent of 1. If zero stimulation is included, however, no additive solution can be found (due to Fechner's paradox). This fact, combined with various critical remarks in the literature with respect to the existence of a real luminance-averaging system, has led us to the development of a model which takes account of Fechner's paradox and incorporates 'realistic' exponents without requiring a multistage processing mechanism where different levels are characterized by different sensory scales. The proposed model makes the weighting coefficients for the two eyes dependent in a continuous way on the strength of stimulation in the two eyes, especially on the amount of contrast of the monocular stimuli. (Author)

A74-40134 Hue discrimination in peripheral vision under conditions of dark and light adaptation. B. A. Ambler (Oregon, University, Eugene, Ore.). *Perception and Psychophysics,* vol. 15, June 1974, p. 586-590. 17 refs. NSF Grant No. GB-24884.

A74-40165 Memory for random shapes - A dual-task analysis. R. T. Kelly and D. W. Martin (New Mexico State University, Las Cruces, N. Mex.). *Journal of Experimental Psychology,* vol. 103, Aug. 1974, p. 224-229. 10 refs.

Two experiments examined the role of rehearsal in the storage of visual information. Both experiments involved recognition of random shapes which varied factorially along five levels of complexity and two levels of codability. In Experiment I an interpolated activity was performed during 4-sec. intervals following stimulus presentation. The interpolated task degraded recognition accuracy. Verbal codability facilitated recognition performance, but no main effect of stimulus complexity on recognition was found. The results of Experiment II, which used simple reaction time probes rather than an interpolated activity, replicate these effects. Retention of visual information appears to require processing capacity. Stimulus characteristics, such as codability, affect the extent of this processing. (Author)

A74-40166 Functional characteristics of visual persistence predicted by a two-factor theory of backward masking. D. E. Erwin and M. Hershenson (Brandeis University, Waltham, Mass.). *Journal of Experimental Psychology,* vol. 103, Aug. 1974, p. 249-254. 8 refs. Grant No. PHS-MH-18092.

Description of the materials and apparatus used and results obtained in two experiments aimed at the study of the functional characteristics of visual persistence within a two-factor theory of backward masking. In one experiment, backward masking was obtained for 50-microsecond targets of seven consonants using a visual noise mask. In the second experiment, postoffset persistence was measured for a blank field, a dark field, and a field containing seven letters using a subtractive reaction time procedure. The results are discussed within the framework of the two-factor theory of backward masking. M.V.E.

A74-40167 Frequency of feedback and learned heart rate control. R. J. Gatchel (Texas, University, Arlington, Tex.). *Journal of Experimental Psychology,* vol. 103, Aug. 1974, p. 274-283. 16 refs. Research supported by the Wisconsin Alumni Research Foundation; Grants No. PHS-MH-10933; No. PHS-MH-35324.

The study investigated the effects of varying frequency of feedback information on learning to accelerate and decelerate heart rate. In the first of two experiments, three feedback frequencies were assessed: information after every heart beat, every 5 beats, and every 10 beats. All feedback groups were compared with a tracking task control group. Results indicated that for speeding sessions, the feedback groups generated faster rates than the tracking group. In addition, there was significant linear trend across feedback group performance, with subjects receiving continuous feedback (every beat) showing the fastest rates. During slowing sessions, the feedback groups performed better than tracking controls, again supporting a general feedback effect. A second experiment replicated the speeding results, again demonstrating that success at this task varies systematically with frequency of information feedback. F.R.L.

A74-40168 Latency of sound localization as a function of azimuth and frequency. F. J. Tolkmitt (Melbourne, University, Melbourne, Australia). *Journal of Experimental Psychology,* vol. 103, Aug. 1974, p. 310-316. 13 refs.

Two experiments are described which investigated by means of backward auxiliary masking the individual localization times of eight loudspeakers arranged equidistantly on a horizontal azimuth around the subject. In the first experiment, the subjects had to localize a 20-msec tone of 1000 Hz, followed by a 500-msec mask of white noise at 1 of 10 delay intervals. Localization accuracy improved with increasing delay. The notion of differential processing time was supported by the finding that rate of improvement depended on speaker position. To meet the argument that these results could have been caused by the tonal quality of individual speakers, the study was repeated with the subjects rotated by 90 deg. Also, frequency of tone was varied so that binaural time differences as well as intensity differences were mediating the localization decision. Despite rotation of the subject, the same effects as in the first study were obtained. F.R.L.

A74-40169 Detectability of relative motion as a function of exposure duration, angular separation, and background. L. O. Harvey, Jr. and J. A. Michon (Instituut voor Zintuigfysiologie RVO-TNO, Soesterberg, Netherlands). *Journal of Experimental Psychology,* vol. 103, Aug. 1974, p. 317-325. 26 refs. Research supported by the Institute for Road Safety Research of Netherlands.

A74-40170 **Comparison of performance with headphone and free-field noise.** L. R. Hartley and A. Carpenter (Medical Research Council, Applied Psychology Unit, Cambridge, England). *Journal of Experimental Psychology*, vol. 103, Aug. 1974, p. 377-380. 7 refs. Research supported by the Royal Navy.

Continuous loud noise presented in the free field has been found to cause impairment in a variety of tasks. Performance on the five-choice serial reaction test in continuous loud noise presented over headphones and in the free field was compared. Sound-pressure level was the same in both conditions. Impairment of performance occurred in both noise conditions. A three-way interaction indicated a tendency for headphone noise to have a larger effect on gaps and for free-field noise to have a larger effect on errors. Differences between the two modes of presentation may be related to perceptual deprivation and to annoyance effects of noise. (Author)

A74-40276 **Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings.** *Aerospace Medicine*, vol. 45, Aug. 1974, Section 2. 72 p.

Topics discussed include the role of aviation pathology within the Group System of accident investigation, experiments on pigs to provide data for the development of thermal protective clothing, a review of autopsy reports of burned Army aviators, a method of evaluating torque effects during ejection from prototype and operational ejection seats, heart injuries resulting from seat ejection, the role of focal myocarditis in aircraft accidents, the use of measurements of postmortem lactate and postmortem potassium levels to determine cardiac damage in victims of aircraft accidents, and the role of toxicological analysis in aircraft accident investigation.

Individual items are announced in this issue. A.B.K.

A74-40277 **Aviation pathology and the group system - A case of breakup in the air.** J. K. Mason (RAF, Institute of Pathology, Aylesbury, Bucks., England). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 928-930. 5 refs.

Description of a fatal accident involving a light aircraft that lost a wing and its tail unit while flying at a height of 6,000 ft. The pilot and three passengers were killed. The investigation utilized all the subdivisions of aviation pathology. The mistakes made and the interpretation difficulties experienced are discussed. The comprehensive nature of pathological accident investigation is illustrated in the area of safety equipment appraisal. M.V.E.

A74-40278 * **The deadly triad.** W. E. Barry (NASA, Washington, D.C.). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 931, 932.

The contributions of a design deficiency, supervisory shortcoming, and pilot error to the occurrence of a major accident involving a mechanically intact fighter aircraft during VFR weather are analyzed. The need for physiologically oriented flight surgeons to exercise critical judgment about the adequacy of the man-machine interface is pointed out. M.V.E.

A74-40279 **Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration.** F. S. Knox, III, G. R. McCahan, Jr., and T. L. Wachtel (U.S. Army, Aeromedical Research Laboratory, Fort Rucker, Ala.). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 933-938. 12 refs.

A74-40280 **Deaths from burns in Army aircraft, 1965-1971.** W. M. Braunohler (U.S. Army, Aeromedical Research Laboratory, Fort Rucker, Ala.) and R. R. McMeekin (Armed Forces Institute of Pathology, Washington, D.C.). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 939-941. 7 refs.

A review of the autopsy reports of burned Army aircrewmembers received by the Armed Forces Institute of Pathology during the period 1965 through 1971 revealed that most delayed deaths were from respiratory complications. Contributing factors leading to death in each case were recorded. The introduction of crashworthy fuel systems in UH-1 rotary-wing aircraft and fire-resistant outerwear garments has greatly reduced the incidence of injury to aircrewmembers from burns. The reduction of injury caused by fire will remain a perplexing problem, however. Implications of the study were that damage to the lungs by toxic gases may predispose the victim to fatal pulmonary complications. Treatment is difficult, but prevention may solve the problem. (Author)

A74-40281 **Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats.** B. H. Kaplan (U.S. Army, Aeromedical Research Laboratory, Fort Rucker, Ala.). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 942-944.

Studies indicate that a high proportion of vertebral fractures occur during ejections utilizing the Martin-Baker MK-J5 system. Modern ejection seat design criteria do not allow for torque effects during an ejection sequence. A rapid technique to evaluate this parameter in prototype and operational ejection seats is described. (Author)

A74-40282 **Cardiac injuries resulting from ejection.** S. Krefft (Bundesministerium der Verteidigung, Flugmedizimisches Institut, Fürstenfeldbruck, West Germany). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 948-953. 52 refs.

During ejection, the body of a pilot is exposed to impact-like acceleration forces. If elasticity limits of various body tissues are exceeded, injuries result. It is reported that ejection may not only cause injuries to the spinal column but also to other inner organs, particularly to the heart. As evidence, the pathological findings on a pilot, who was fatally injured as a result of emergency ejection are presented. In order to secure evidence of traumatic cardiac damages after ejection and to commence treatment, but also for reasons of flying safety, it is recommended that these pilots not only be given a radiological, but also a thorough cardiological examination prior to resuming flying duty. (Author)

A74-40283 **Myocarditis and the aircraft accident.** I. M. Sopher (Armed Forces Institute of Pathology, Washington, D.C.). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 963-967. 7 refs.

Consideration of focal myocarditis, recognized by forensic pathologists as a cause of sudden death among asymptomatic ambulatory persons. As with any preexisting disease noted upon aviator autopsy, final judgment in any particular case must depend upon all of the circumstances surrounding the accident. The pathologist must bear in mind that this lesion has been documented as an incidental autopsy finding in 5% (and possibly more) of the population. M.V.E.

A74-40284 **Kinematics of aircraft occupants in accidents - Feasibility of computer simulation.** R. R. McMeekin (Armed Forces Institute of Pathology, Washington, D.C.). *(Joint Committe on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine*, vol. 45, Aug. 1974, Section 2, p. 970-974. 10 refs. DA Project 3AO-62110-A-819.

Computer simulation of aircraft occupant kinematics in accidents is evaluated as an aid in meaningful crash injury analysis. Fatal injuries sustained in a helicopter accident are analyzed by a program model using mathematical simulation by computer. Com-

puter simulation is shown to hold promise of becoming a useful tool for improving the art of aircraft crash injury analysis. M.V.E.

A74-40285 Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents. W. R. Franks, A. R. Kempton, I. H. Anderson, and P. Yartez (Department of National Health and Welfare; Defence and Civil Institute of Environmental Medicine, Toronto, Canada). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine,* vol. 45, Aug. 1974, Section 2, p. 980-986. 20 refs.

The tissue postmortem lactate (PML) level includes a measure of glycogen reserves at the time of death. There is evidence that this tissue glycogen level is reversibly associated with a concomitant uptake or release of intracellular potassium. Myocardial tissue glycogen is rapidly depleted locally in conditions of ischaemia from infarction or arteriosclerosis as well as generally with cardiac hypoxia or fatigue. Likewise, myocardial potassium is decreased under similar circumstances. Thus, by simultaneously measuring the PML and the PMK levels in myocardium, useful information as to possible cardiac embarrassment previous to death might be provided. Comparing PML and PMK values of other tissues vis-a-vis the heart provides further evidence as to the specificity of the cardiac changes in these cases in contrast to generalized body inanition, fatigue, or alcoholism. (Author)

A74-40286 Aircraft accident toxicology - U.K. experience 1967-1972. D. J. Blackmore (RAF, Institute of Pathology, Halton, Bucks., England). *(Joint Committee on Aviation Pathology, Scientific Session, 8th, Colorado Springs, Colo., Oct. 8-11, 1972.) Aerospace Medicine,* vol. 45, Aug. 1974, Section 2, p. 987-994. 6 refs.

During the period 1967-1972 extensive toxicological analysis has been undertaken on the victims of all accidents investigated by the department (113 aircraft involving 184 crew and 207 passengers). Tissues and body fluids from crew members have been analyzed for ethanol, drugs, and carbon monoxide, and that of passengers generally for carbon monoxide only. This represents an unselected series of incidents within a fixed geographical area which should illustrate the value or otherwise of routine aviation accident toxicology. As a result of this study the value of routine aircraft accident toxicology is accentuated; in at least 35% of the incidents, the results were of direct significance to the investigating team. It is concluded that toxicological analysis is an essential feature in the investigation of any aircraft accident. (Author)

A74-40334 # The determination of stress and fatigue, taking into account the example of air traffic controllers (Erfassung von Beanspruchung und Ermüdung am Beispiel der Luftverkehrskontrolleure). M. Söll (Gesellschaft für internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Informationen der zivilen Luftfahrt,* vol. 9, no. 2, 1973, p. 121-123. In German.

A description is given of approaches which make it possible to obtain information concerning stress factors and fatigue. One approach is based on the evaluation of physiological phenomena which accompany and follow psychic stresses to which a person is subjected. The tapping test and the net tapping test are psychological tests which are concerned with the performance which corresponds to a specific fatigue level. A method involving a self-evaluation of a subject is based on the use of questionnaires. In another approach changes in the composition of urine are employed as a stress indicator. G.R.

A74-40422 Light-dependent phosphorylation of rhodopsin in living frogs. H. Kühn (Kernforschungsanlage Jülich GmbH, Institut für Neurobiologie, Jülich, West Germany). *Nature,* vol. 250, Aug. 16, 1974, p. 588-590. 18 refs.

A74-40438 # A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects (La ricerca dell'antigene au e degli anticorpi anti au come test deduttivo di alterazioni epatocellulari in soggetti clinicamente sani). G. Nobili, E. Adorisio, and O. Zardi. *Rivista di Medicina Aeronautica e Spaziale,* vol. 36, July-Dec. 1973, p. 165-175. 30 refs. In Italian.

Study of the role of the Australia antigen in hepatic pathology in clinically healthy subjects, bearing in mind that the Au antigen and anti-Au antibodies are regarded as the expression of prior or actually occurring liver disorder. A determination was made of the Au antigen and anti-Au antibodies in a large number (3026) of clinically healthy subjects with negative hepatic anamnesis according to the technique of fixation of the complement proposed by the World Health Organization and the technique of the bentonite allied antibody. The positive results obtained were 12 for the Au antigen (0.39%) and 26 for the anti-Au antibodies (0.52%). In spite of the low percentage of positive cases, the authors are of the opinion that a systematic study of the type performed by them is to be recommended for a more thorough analysis of the state of health of subjects being evaluated with regard to flight fitness. A.B.K.

A74-40439 # Observations of the embryonal rat pancreas during chronic hypoxia (Osservazioni sul pancreas embrionale di ratto in ipossia discontinua). C. Vacca and A. de Girolamo (Napoli, Università, Naples, Italy). *Rivista di Medicina Aeronautica e Spaziale,* vol. 36, July-Dec. 1973, p. 176-183. 5 refs. In Italian.

Experimental study of the embryonal pancreas in gestating rats subjected to chronic hypoxia for three hours every day from the eighth to the twentieth day of gestation at 308 mm Hg (corresponding to a fictitious altitude of 7000 m). An attempt is made to examine from the histological and ultrastructural standpoints the evolution that the elements of such a parenchyma undergo, with particular regard to insular cytotypes. It is found that in the endocrine pancreas an increase in beta cells occurs, which is regarded as the expression of a major insulin secretion in response to hyperglycemia caused by stimulation of the diencephalo-adrenal axis. A.B.K.

A74-40440 # Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine (Determinazione degli stati di emozionabilità in volo in allievi piloti, mediante il dosaggio dell'acido vanil-mandelico /AVM/ eliminato con le urine). G. Paolucci and G. Blundo (Aeronautica Militare, Rome, Italy). *Rivista di Medicina Aeronautica e Spaziale,* vol. 36, July-Dec. 1973, p. 184-196. 9 refs. In Italian.

Experimental study of the possibility of determining increased catecholamine circulation due to stress in student pilots undergoing basic flight training by measuring the quantity of vanilmandelic acid (VMA) excreted with the urine. The procedure employed involved the comparison of VMA levels on Sunday, a day of flight inactivity, with those measured on Monday, a regular training day. In both samplings the total quantity of VMA present was measured by the spectrophotometric technique of Sandler and Ruthven (1959). It is found that, in comparison with the initial values, the postflight values of VMA show increases averaging 94 to 96 percent. The subjects were divided into five groups according to their reactions to the stress situation, ranging from a group which showed a decrease in the VMA level to one which showed a more than 200 percent increase, with the largest percentage (31 percent) of the subjects falling into a group in which a 20 to 100 percent increase was noted. A.B.K.

A74-40441 # Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race (Comportamento psico-diagnostico al test di Zulliger collettivo di un gruppo di soggetti di razza negra confrontato con quello di un gruppo similare di razza bianca). F. Sparvieri. *(Società Italiana Rorschach, Riunione, Rome, Italy, Apr. 14, 1973.) Rivista di Medicina Aeronautica e Spaziale,* vol. 36, July-Dec. 1973, p. 197-204. 8 refs. In Italian.

A74-40442 # **Modern views on oxygen toxicity (Moderne vedute sulla tossicita' dell'ossigeno).** A. Polistena. *Rivista di Medicina Aeronautica e Spaziale*, vol. 36, July-Dec. 1973, p. 205-243. 200 refs. In Italian.

Detailed review of the harmful effects of exposure to oxygen at above-atmospheric pressures on the human organism. Following a brief summary of the chemical reactions of autooxidation of lipid chains, the effects of oxygen at high pressures on substances (such as glutathione) containing sulfhydryl groups and, in particular, on enzymes containing such groups are examined. After comparing the effects of oxygen with those of radiant energy, both seeming to be mediated by the action of free radicals, a study is made, firstly, of the effects of exposure to high-pressure oxygen on cellular organules and whole isolated cells and, secondly, of the effects on whole organisms. After briefly reviewing the mechanisms of action of antioxidation drugs, some theories are developed which attribute the causes of oxygen toxicity (hyperoxia) to the entire combination of actions of oxygen on lipid chains, on substances containing sulfhydryl groups, and on the inhibition of specific enzymatic agents. A.B.K.

A74-40447 **Coronal topography of human auditory evoked responses.** F. Peronnet, F. Michel, J. F. Echallier, and J. Girod (Institut National de la Santé et de la Recherche Médicale, Bron, Rhône; Hôpital Neurologique, Lyons, France). *Electroencephalography and Clinical Neurophysiology*, vol. 37, Sept. 1974, p. 225-230. 24 refs.

Experimental work is reported on evaluating topographical recording of human auditory evoked responses (AERs) as a useful test in auditory trouble of central origin. The results of a study performed on 26 normal subjects and 3 patients with hemispheric lesion involving Heschl's gyrus are shown to confirm the objectivity and usefulness of such a test technique. M.V.E.

A74-40448 **Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man.** V. Vignaendra, R. L. Matthews, and G. E. Chatrian (Washington, University, Seattle, Wash.). *Electroencephalography and Clinical Neurophysiology*, vol. 37, Sept. 1974, p. 239-246. 41 refs.

The results of a study of positive occipital sharp transients of sleep (POSTS) during both nonrapid eye movement (NREM) and rapid eye movement (REM) sleep in six subjects are shown to suggest the possibility that some form of 'playback' of information takes place during NREM sleep in cortical areas related to vision. The purpose of this postulated playback might be to reexamine vast amounts of visual material collected during the day. M.V.E.

A74-40449 **Comments on estimations and tests of EEG amplitude distributions.** J. Persson (Sahlgren Hospital, Goteburg, Sweden). *Electroencephalography and Clinical Neurophysiology*, vol. 37, Sept. 1974, p. 309-313. 20 refs. Research supported by Gotaverken, Ltd. SMRC Project B74-19X-825-09A.

Problems associated with estimations and tests of EEG amplitude distribution are discussed. The views of other investigators on these problems are reviewed. A number of tests applied to an EEG sequence suggests that an experimental design giving a mutual dependence of less than 0.5 between adjacent samples may be reasonable. M.V.E.

A74-40450 **Dissociation of slow potentials and phasic multiple unit activity.** J. B. Munson (Florida, University, Gainesville, Fla.). *Electroencephalography and Clinical Neurophysiology*, vol. 37, Sept. 1974, p. 314-316. 12 refs. NSF Grant No. GB-7622; Grant No. NIH-MH-10320-08.

Discussion of the effects that optic neurotomy produces during rapid-eye-movement sleep in cats with chronically implanted electrodes upon ponto-geniculate-occipital waves and integrated multiple unit activity in the lateral geniculate nuclei and visual cortex. The dissociation of normally concurrent physiological events these effects show provides evidence for the electrophysiological basis of these activities. M.V.E.

A74-40462 **ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion.** G. Timogiannakis, I. Amende, E. Martinez, and M. Thomas (Hammersmith Hospital, London, England). *Cardiovascular Research*, vol. 8, July 1974, p. 469-477. 14 refs. Research supported by the World Health Organization and Deutsche Forschungsgemeinschaft.

A74-40463 **Estimation of stroke volume from the pulmonary artery pressure record.** A. A. Zacharoulis, C. J. Mills, I. T. Gabe, and J. P. Shillingford (Hammersmith Hospital, London, England). *Cardiovascular Research*, vol. 8, July 1974, p. 506-516. 12 refs.

This study describes the estimation of stroke volume in a series of dogs by a pulse contour method applied to the pulmonary artery pressure record. The results correlated well with measurements of stroke volume by an electromagnetic flowmeter and by indicator dilution curves when changes were produced by noradrenaline, isoproterenol, propanolol, hemorrhage, pacing, and respiratory outflow occlusion. However, when saline was rapidly infused, error increased significantly. (Author)

A74-40464 **A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog.** A. B. Weisse and T. J. Regan (New Jersey, College of Medicine and Dentistry, Newark, N.J.). *Cardiovascular Research*, vol. 8, July 1974, p. 526-533. 15 refs. Research supported by the American Heart Association; Grant No. PHS-GRS-137831.

A74-40465 **Left ventricular volume as a determinant of myocardial oxygen consumption.** J. Simaan (Beirut, American University, Beirut, Lebanon). *Cardiovascular Research*, vol. 8, July 1974, p. 534-540. 14 refs. Research supported by the Lebanese National Research Council.

A74-40473 **Intraventricular conduction defects in acute myocardial infarction.** P. Rizzon, M. Di Biase (Policlinico, Bari, Italy), and C. Baissus (Policlinico, Bari, Italy; Cliniques Saint Elois, Montpellier, France). *British Heart Journal*, vol. 36, July 1974, p. 660-668. 41 refs.

A74-40474 * **Alterations in left ventricular volumes induced by Valsalva manoeuvre.** J. Z. Brooker, E. L. Alderman, and D. C. Harrison (Stanford University, Stanford, Calif.). *British Heart Journal*, vol. 36, July 1974, p. 713-718. 7 refs. NIH-NASA-supported research.

Five patients were studied with left ventriculography during different phases of the Valsalva manoeuvre. Small doses of contrast medium allowed adequate repetitive visualization of the left ventricle for volume calculation. During strain phase, the volume of the left ventricle decreased by nearly 50 per cent in each case, and stroke volume and cardiac output also dropped strikingly. Release of straining was attended by a sharp rebound of left ventricular volume to control levels, with a transient surge of increased cardiac output 42 per cent above that of the resting state. (Author)

A74-40478 **Control processes in biology and technology (Die Regelvorgänge in Biologie und Technik).** A. M. Pupato. *Schweizerische Technische Zeitschrift*, vol. 71, Aug. 15, 1974, p. 621-631. 8 refs. In German.

Basic general principles of control processes are considered along with aspects of pneumatic control, the operation of a thermostat, the technical and physiological control system, and various types of controllers. Fundamental control mechanisms of biological controllers are examined, giving attention to the principle of negative feedback. Disturbances occurring in physiological control systems are discussed and a description of the mechanisms involved in controlling the blood pressure is presented. G.R.

A74-40621 # **USAF School of Aerospace Medicine survival training.** T. C. Forister (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *SAFE Journal*, vol. 4, Fall 1974, p. 6-8.

Students attending courses that lead to flying designations receive 52 hours in survival training. The overall purpose of this program is to train personnel preparing for flight duties in the application of noncombatant procedures, equipment, and techniques which would permit them to survive, to care for their passengers, and to assist in a safe recovery. The areas covered in the training program include survival stresses, environmental hazards and medical aspects of survival, food and water precurement, communications, rescue, and survival display. G.R.

A74-40661 # **Combined method for studying the quality, 'roughness', and stability of ergatic control systems (Kombinovanii metod doslidzhennia iakosti, 'grubosti' ta stiikosti ergatichnikh sistem keruvannia).** V. V. Pavlov and V. S. Khominich. *Avtomatika*, vol. 19, May-June 1974, p. 71-75. 5 refs. In Ukrainian.

Recent trends in the development of ergatic control systems are reviewed. The validity of a function developed by Krasnoselskii et al. (1969) in the evaluation of the properties of ergatic control systems is examined. Linear and nonlinear ergatic control systems are covered. V.Z.

A74-40678 **A model of cardiac muscle dynamics.** E. S. Grood (Dayton, University, Dayton, Ohio), R. E. Mates (New York, State University, Buffalo, N.Y.), and H. Falsetti (Iowa, University, Iowa City, Iowa). *Circulation Research*, vol. 35, Aug. 1974, p. 184-196. 58 refs. NSF Grant No. GK-31905.

A mathematical model is presented describing the time- and length-dependent behavior of cardiac muscle. The model describes a wider variety of experimental data than do previously published models. It incorporates a modification of the Hill equation describing the force-velocity relation. Based on the sliding filament theory, the revised equation includes the effects of finite cross-bridge compliance proposed by A. F. Huxley. The essential simplicity of the Hill equation is retained; however, the model successfully predicts force development during both isometric and isotonic contractions, observed deactivation of the contractile element during isotonic shortening, and the apparent dependence of series elastic stiffness on time after stimulation during quick-release and quick-stretch experiments. (Author)

A74-40679 **Relationship of the functional refractory period to conduction in the atrioventricular node.** G. R. Ferrier (Masonic Medical Research Laboratory, Utica, N.Y.) and P. E. Dresel (Manitoba, University, Winnipeg, Canada). *Circulation Research*, vol. 35, Aug. 1974, p. 204-214. 15 refs. Research supported by the Medical Research Council of Canada.

A significant effect of the conduction time of regular beats is reported to have been found by measuring the atrioventricular-node conduction times of atrial extrasystoles from a bundle of isolated blood-perfused dog hearts. It is shown that an important cause of decreases in functional refractory periods occurring at increased heart rates is the change in the conduction time of regular beats. M.V.E.

A74-40680 **Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat.** B. H. Forman and P. J. Mulrow (Yale University, New Haven, Conn.). *Circulation Research*, vol. 35, Aug. 1974, p. 215-221. 30 refs. Grant No. NIH-HL-12758.

A74-40681 **Hypoxic pulmonary vasoconstriction in the rat The necessary role of angiotensin II.** S. Berkov (California, University, San Francisco, Calif.). *Circulation Research*, vol. 35, Aug. 1974, p. 256-261. 16 refs. Research supported by the Pharmaceutical Manufacturers Association; Grants No. NIH-GM-16496; No. NIH-GM-01791; No. NIH-HL-09964; No. NIH-HL-06285.

A74-40682 **Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides.** R. M. Berne, R. Rubio, and R. R. Curnish (Virginia, University, Charlottesville, Va.). *Circulation Research*, vol. 35, Aug. 1974, p. 262-271. 15 refs. Grant No. NIH-10384.

A74-40683 **The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction.** C.-S. Liang (Boston City Hospital, Boston, Mass.) and W. B. Hood, Jr. (University Hospital, Boston, Mass.). *Circulation Research*, vol. 35, Aug. 1974, p. 272-280. 38 refs. Research supported by the Pharmaceutical Manufacturers Association Foundation and Ayerst Laboratories; Grants No. NIH-HE-07299; No. NIH-HL-14646; No. PHS-5-T01-HL-598603.

A74-40684 **Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture.** J.-L. Cuche (Mayo Clinic, Rochester, Minn.), O. Kuchel (Montreal, Clinical Research Institute, Montreal, Canada), A. Barbeau, Y. Langlois, R. Boucher, and J. Genest (Montreal, Hôtel-Dieu Hospital, Montreal, Canada). *Circulation Research*, vol. 35, Aug. 1974, p. 281-297. 59 refs. Research supported by the W. Garfield Weston Foundation; Medical Research Council of Canada Grant No. MA-4938.

A74-40685 **Mechanical and biochemical correlates of cardiac hypertrophy.** N. R. Alpert, B. B. Hamrell, and W. Halpern (Vermont, University, Burlington, Vt.). *Circulation Research*, Supplement no. 2, vol. 35, Aug. 1974, p. II-71 to II-82. 54 refs. Research supported by the American Heart Association and NSF; Grant No. PHS-5-S01-RR-05429-12-S1.

Right ventricular hypertrophy was produced in rabbits by banding the pulmonary artery to produce an 80 to 90% reduction in the lumen size. There was an increase in right ventricular systolic pressure from 19.2 to 40.5 mm Hg while the end-diastolic pressure increased from 1.5 to 3.0 mm Hg. There were no signs of heart failure. Right ventricular wet and dry weights of the experimental animals increased 53 and 62%. Cardiac muscle mechanics were studied in isolated right ventricular papillary muscles by means of the isotonic quick release and the pseudorandom white noise perturbation methods. Force-velocity measurements carried out at peak dp/dt and constant sarcomere length were depressed in the hypertrophied heart. Series compliance was normal while parallel compliance exhibited a 250% decrease. The mechanical alterations were analyzed in terms of possible changes in Ca(++) transport as well as differences in the contractile protein. (Author)

A74-40686 **Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy.** C. R. Honig (Rochester, University, Rochester, N.Y.) and J. Bourdeau-Martini (Paris XI, Université, Paris, France). *Circulation Research*, Supplement no. 2, vol. 35, Aug. 1974, p. II-97 to II-103. 18 refs. Grant No. NIH-HL-03290.

A74-40753 **Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects.** J. M. Bradford, Jr., R. H. Ingram, Jr., J. A. Davis, and G. D. Finlay (Grady Memorial Hospital; Georgia Institute of Technology, Atlanta, Ga.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 139-144. 13 refs. Grant No. NIH-HL-12002.

In seven normal subjects the alveolar to arterial pressure difference for oxygen (AaDo2) was measured during several levels of ventilation at a constant inspired partial pressure of oxygen. In the first series of tests (series 1) the subjects changed ventilation voluntarily with air such that alveolar CO2 tension varied inversely and alveolar oxygen pressure varied directly with ventilation. The AaDo2 correlated more strongly with alveolar oxygen pressure than with alveolar CO2 pressure in series 1 data. In the second series of tests (series 2) the subjects hyperventilated at a constant level while

alveolar CO2 pressure was changed and alveolar oxygen pressure was held constant. The AaDo2 did not change with alveolar CO2 pressure in series 2 data. (Author)

A74-40754 **Sequence of regional filling during a tidal breath in man.** B. J. B. Grant, H. A. Jones, and J. M. B. Hughes (Hammersmith Hospital, London, England). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 158-165. 20 refs.

Sequential portions of inspired gas were labeled with boluses of xenon 133 and inhaled at constant flow rates (0.1 to 1.0 liter per sec) from functional residual capacity. Twelve normal subjects were studied seated upright. The distribution of boluses injected at the mouth varied with flow rate; at 0.1 liter per sec basal ventilation exceeded apical. At 0.4 liter per sec base and apex ventilation was equal, and at 1.0 liter per sec apical ventilation exceeded basal. At comparable flow rates the distribution of boluses injected into the trachea was similar to those introduced at the mouth but when inhaled through 500 ml of added dead space, basal ventilation exceeded apical at all flow rates studied. These results suggest that the distribution of inspired gas varies with flow rate over the first part of the tidal volume but becomes more independent of flow rate as inspiration continues. (Author)

A74-40755 * **Intrathoracic and venous pressure relationships during responses to changes in body position.** P. Avasthey and E. H. Wood (Mayo Clinic and Mayo Foundation, Rochester, Minn.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 166-175. 25 refs. Research supported by the American Heart Association; Grants No. NIH-HL-3532; No. NIH-FR-7; No. NsG-327.

Simultaneous end-expiratory pressures, referred to midthoracic level, in the superior and abdominal venae cavae, pericardial space, and right and left heart, were recorded without thoracotomy in three anesthetized dogs during sudden changes from supine to vertical head-up or head-down body positions. Intrathoracic and dependent great vein pressures referred to midchest level (sixth thoracic vertebra) decreased and showed simple hydrostatic gradients in either vertical position. However, a discontinuity in the large vein hydrostatic gradient occurred just distal to the superior margin of the thorax in either body position and was resumed again above this level. It is concluded that, just as the cerebrospinal fluid and intraperitoneal pressures minimize the effects of gravitational and inertial forces on the cerebral and visceral circulations, the pericardial and pleural pressures have a similar role for the heart proper. (Author)

A74-40756 **Pressures developed by loaded inspiratory muscles in conscious and anesthetized man.** D. J. C. Read, S. Freedman, and E. R. Kafer (Royal Postgraduate Medical School, London, England). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 207-218. 37 refs. Research supported by the North Foundation, Medical Research Council of England, National Health and Medical Research Council of Australia.

The study originated from an attempt to apply the analysis of Pengelly and Milic-Emili to resistive loading. In contrast to their results for elastic loading (1970), the tidal volume response to resistive loading did not match the predictions for a response which was solely based on nonreflex intrinsic muscular mechanisms. This discovery led to reexamination of the validity of the model proposed by Milic-Emili and Pengelly. Theoretical analysis demonstrated that the steady state sinusoidal model was mathematically invalid in many of the common experimental conditions. These difficulties can be overcome with the use of digital computer programs which utilize experimentally determined wave forms and, when required, provide nonsteady-state predictions. In a second section, the wave forms of inspiratory pressure (Pmus) are compared for normal breaths and breaths during elastic and resistive loading. The results poorly match the predictions of proposed models in which 'effective' values of elastance and resistance incorporate the effects of load-compensating mechanisms. F.R.L.

A74-40757 **Effect of anesthesia on rate of N2 washout from body stores.** A. C. Groom (New York, State University, Buffalo, N.Y.), Y. Ohta (Keio University, Tokyo, Japan), L. E. Farhi (Western Ontario, University, London, Canada), and S. H. Song. *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 219-223. 7 refs. USAF-supported research; Contract No. N00014-68-A-0216. NR Project 101-722.

The effects of anesthesia on N2 washout from body stores of dogs breathing a nitrogen-free mixture were studied by comparing the rate of N2 elimination in anesthetized supine dogs and in conscious upright animals. Anesthesia changes considerably the pattern of N2 washout. Whereas the unanesthetized dog eliminates 50% of its nitrogen store in 15 min, the anesthetized animal requires four times as long. Analysis of the data obtained on anesthetized animals made it possible to distinguish between the delay caused by an overall decrease in cardiac output (to 58% of control value) and that caused by redistribution of peripheral circulation. The rate constant of the 'slow compartment' is essentially the same in both groups of animals, but this 'compartment', which includes 36.4% of the N2 store in conscious animals, represents 74.5% of the tissue N2 in anesthetized animals. (Author)

A74-40758 **Continuous recording of multiple parameters during perfusion of human colon.** A. Chauve, G. Devroede, and J.-L. Sasseville (Sherbrooke, Université, Sherbrooke, Quebec, Canada). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 241-246. 40 refs. Medical Research Council Grant No. MA-3511.

In eight human volunteers, several parameters of colonic physiology were studied simultaneously: movement of water and electrolytes, transit time of solutions perfused in the colon, intraluminal pressure, and potential differences (PD). During colonic perfusion with isotonic saline (15 ml/min), after establishment of steady-state conditions, a PD of 17.4 plus or minus 1.8 mV was found to exist in the right colon, mucosa being negative. Impedance of the system varied little during the experiment, but in the same individual PD fluctuated with time and was markedly influenced by the perfusion. Pressure waves were simple and periodic. Their amplitude ranged from 11.1 to 25.4 cm H2O, their duration from 16 to 35 sec, and their frequency from 0.10 to 0.90 wave/min. They were accompanied by a subjective impression of contraction in the right iliac fossa. (Author)

A74-40759 **Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration.** D. B. Dill (University of Nevada System, Boulder City, Nev.) and D. L. Costill (Ball State University, Muncie, Ind.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 247, 248. NSF Grant No. GB-35281; Grant No. NIH-HD-05625.

Observations on hematocrit (Hct) and hemoglobin (Hb) were made in six men before and after running long enough to cause a 4% decrease in body weight. Subscripts B and A were used to denote before dehydration and after dehydration, respectively. Relations were derived between BV sub B, BV sub A, Hb sub B, Hb sub A, Hct sub B, and Hct sub A with which the percentage decreases in BV, CV, and PV, as well as the concentration of hemoglobin in red cells, can be calculated. When subjects reach the same level of dehydration, the water loss from the various body compartments may vary, reflecting differences in salt losses in sweat. Changes in PV calculated from the increase in plasma protein concentration averaged -7.5% compared with -12.2% calculated from changes in Hb and Hct. The difference could be accounted for by a loss of 6% plasma protein from the circulation. (Author)

A74-40760 **Fluid flow in a model alveolar sac.** F. F. Cinkotai (Manchester, Victoria University, Manchester, England). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 249-251. 11 refs.

To throw light upon airflow in the alveolar region of the human lung, a simple latex model of an alveolar sac filled with viscous silicone fluid was constructed. The model, placed in a thermostatically controlled bath, was rhythmically expanded and contracted

as are the alveoli of the lung, maintaining Reynold's number at the alveolar value. Dyed layers injected into the model to visualize the tidal-residential interface were found to be preserved from one cycle to another, only if the model expanded and contracted through a series of geometrically similar shapes. As fluid flow in the model resembles that in the alveoli, this condition of reversibility must also apply to the alveolar airflow. That is, unless the alveolar region expands and contracts homogeneously during breathing, the tidal and residential phase will mix mechanically. (Author)

A74-40761 A contact stimulator for the study of cutaneous thermal sensibility. R. Hilder, E. Ramey, I. Darian-Smith, K. O. Johnson, and L. J. Dally (Sydney University, Sydney; Melbourne, University, Melbourne, Australia; John Hopkins University, Baltimore, Md.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 252-255. 7 refs. Research supported by the National Health and Medical Research Council of Australia; Grants No. PHS-NB-06828; No. PHS-5-T01-GM-00443.

A thermal stimulator operating by the rapid conduction of heat to and from a localized area of skin was developed for physiological studies of cutaneous and thermal sensibility. The instrument allows the active regulation of a region of skin approximately 1 cm in diameter over a background temperature range of 30 C, and over a transient temperature range of 10 C. Both warming and cooling pulses may be readily and successively generated. Stimulus temperatures are controlled by a feedback system and are largely independent of varying thermal loads imposed by the underlying tissue. The response time, including transport delays, is 0.25 sec for a stimulus temperature change of 10 C. The full power bandwidth is 1 Hz, with attenuation of 50% at 3 Hz. Peak-to-peak high-frequency noise in the output of the stimulator thermocouple has a standard deviation of less than 0.006 C. (Author)

A74-40762 * Telemetry of left ventricular diameter and pressure measurements from unrestrained animals. T. A. Patrick (Peter Bent Brigham Hospital, Boston, Mass.), S. F. Vatner (Children's Hospital Medical Center, Boston, Mass.), W. S. Kemper (California, University, San Diego, Calif.), and D. Franklin (Scripps Clinic and Research Foundation, La Jolla, Calif.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 276-281. 15 refs. Research supported by the American Heart Association and NASA; Grants No. PHS-HL-15416; No. PHS-HL-13441; No. PHS-HL-12373.

A74-40763 Extent of myocardial flow from luminal collateral circulation. D. E. Fixler, M. Wheeler, and D. Huffines (Texas, University, Dallas, Tex.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 282-285. 19 refs. Research supported by the American Heart Association.

Study of the extent of luminal collateral flow by measuring the transport of radioactive microspheres directly from the ventricular chambers into the myocardium in anesthetized dogs. The results show that luminal flow does not contribute to myocardial perfusion even under abnormal conditions of hypoxemia and decreased coronary perfusion pressure. M.V.E.

A74-40764 Two-tracer method for rapid determination of residual volume. S. A. Nunneley, E. T. Flynn, Jr., and E. M. Camporesi (New York, State University, Buffalo, N.Y.). *Journal of Applied Physiology*, vol. 37, Aug. 1974, p. 286-289. 8 refs. USAF-supported research; Contract No. N00014-68-A-0216. NR Project 101-722; NR Project 101-511.

A method for determining the residual volume is described that is based on rebreathing and uses simultaneous measurements of both nitrogen and a second external tracer gas. This 'two-tracer technique' cancels the respiratory-exchange-ratio effect and makes allowance for the small quantities of inert gas which are exchanged during rebreathing. M.V.E.

A74-40765 * Respiratory gas exchange of high altitude adapted chick embryos. O. D. Wangensteen, H. Rahn (New York, State University, Buffalo, N.Y.), R. R. Burton, and A. H. Smith (California, University, Davis, Calif.). *Respiration Physiology*, vol. 21, July 1974, p. 61-70. 15 refs. Research supported by the State University of New York; Grants No. PHS-HE-01920; No. NGR-05-004-008.

Study of gas exchange by embryos from chickens acclimatized to an attitude of 3800 m. The oxygen partial pressure and carbon dioxide partial pressure differences across the egg shell were measured and found to be less than the values previously reported for sea-level eggs by about a factor of two. Further measurements of embryonic oxygen consumption and shell conductivity to oxygen indicated that, compared to eggs at sea level, oxygen consumption was reduced by a factor of 0.58 while conductivity to oxygen was increased only by a factor of 1.07 in the high-altitude eggs. These independent measurements predict the change in oxygen partial pressure across the egg shell of the high-altitude eggs to be only 0.54 times that of sea-level eggs; the directly measured factor was 0.53. The authors conclude that at high altitude, a major adaptation of the chick embryo is a reduced metabolism which decreases the change in oxygen partial pressure across the egg shell since its gas conductivity remains essentially unchanged. (Author)

A74-40766 Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model. L. Baker, J. S. Ultman, and R. A. Rhoades (Pennsylvania State University, University Park, Pa.). *Respiration Physiology*, vol. 21, July 1974, p. 119-138. 20 refs. Grant No. NIH-FR-7082-06.

Finite difference solutions of the differential diffusion equation, incorporating simultaneous longitudinal diffusion and exponentially time varying flow, served as simulations of single-breath nitrogen washout. Using Weibel's anatomic model 'A' for the conducting airways and assuming a well-mixed alveolar region, an anatomic dead space 70% larger than commonly measured values was predicted. This is due in part to the Weibel parameter values which overestimate conducting airway volume when inspiration is initiated at FRC. To test the reasonableness of the model, simulations with varying respiratory conditions were performed. The predicted dead space decrease for an increase in inspiration time, for a decrease in inspiratory volume and for an increase in diffusion coefficient were in agreement with experimental data. Decreases in dead space by breath-holding and increased expiratory times followed the experimental trends only qualitatively. (Author)

A74-40797 # Effect of hypokinesis and enforced posture on human perception of time (Vliianie gipokinezii i vynuzhdennoi pozy na vospriiatie vremeni chelovekom). N. D. Bagrova. *Voenno-Meditsinskii Zhurnal*, June 1974, p. 46, 47. In Russian.

Determination of the accuracy of measuring and reproducing time intervals in a number of young adult males subjected to three day periods of enforced posture with restricted movement. It is shown that prolonged subjection to enforced posture and restricted motor activity leads to an impairment of time-estimating ability, with the degree of accentuation of the error depending on individual peculiarities of the subjects and the degree to which they are trained to withstand the effect of unfavorable factors. A.B.K.

A74-40798 # Certain methodological approaches to studying pilot activity errors (Nekotorye metodicheskie priemy izucheniia oshibok v deiatel'nosti letchikov). A. A. Kupriianov and V. V. Dudnikov. *Voenno-Meditsinskii Zhurnal*, June 1974, p. 48-52. In Russian.

Development of a methodological approach to studying erroneous pilot actions caused by certain psychological factors. A distinction is made between the various kinds of erroneous actions that could theoretically be detected and ultimately brought to the attention of a physician - namely, premature or delayed actions, disturbances of the structure or tempo of working motions, the

performance of a given set of actions instead of another, involuntary actions, etc. These various categories are defined in some detail, noting the special danger of involuntary actions. Errors of omission can also occur, such as failure to perform required operations. Once it has been established that an erroneous action has occurred, the next problem is to determine what caused this action. An erroneous action could result from peculiarities in data perception and processing and in decision making. Psychological processes are shown to play an important role in this connection, and data processing and decision making are shown to depend greatly on the attention function. A.B.K.

A74-40799 # Limits of normal fluctuations of the basic hemodynamic indices in young men (Predely normal'nykh kolebanii osnovnykh gemodinamicheskikh pokazatelei u molodykh liudei). G. P. Zvonarev. *Voenno-Meditsinskii Zhurnal*, June 1974, p. 60-62. In Russian.

Study of the limits of fluctuations of the stroke volume and minute volume of the blood in young men entering officers training school by the method of whole-body rheography. A decrease in these hemodynamic indices with an increase in age is noted both after fasting and after eating, the differences being especially noticeable after eating. In addition, an analysis is made of the effect of age and other variables on the above-mentioned hemodynamic indices determined by the method of whole-body rheography outside the conditions of basal metabolism. In this case only the size of the subject is found to show a close regular relation to these indices. A.B.K.

A74-40800 # The development of myopia in persons working with computer equipment (O razvitii blizorukosti u lits, rabotaiushchikh s elektronno-vychislitel'noi tekhnikoi). V. M. Aboimova. *Voenno-Meditsinskii Zhurnal*, June 1974, p. 67, 68. In Russian.

Results of a ten-year study of the effect of concentrated attention and visual stress on the development of myopia and conjunctival phenomena in computer operators and programmers. The subjects investigated were divided into two groups - a group of operators and programmers and a control group doing work requiring less visual strain. At the start of the observations (1960) blepharoconjunctivitis was noted in 3% of the operators and programmers and in 6% of the control group. By the end of the observations (1970) the incidence of chronic blepharoconjunctivitis had increased to 27 and 15%, respectively. In both groups changes in refraction were recorded. The number of subjects with emmetropic and hypermetropic refraction decreased, while the number of subjects with myopic refraction increased (almost twofold during the ten-year period). A.B.K.

A74-40893 Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations. S. Werthamer, P. D. Penha, and L. Amaral (Brooklyn, Methodist Hospital; Downstate Medical Center, Brooklyn, N.Y.). *Archives of Environmental Health*, vol. 29, Sept. 1974, p. 164-166. 15 refs.

The effect of prolonged and repeated exposure of mice to low levels of ozone was studied during a 120-day period. During this time, severe alterations were observed in the synthesis of lung DNA (decreased), RNA (decreased), and protein (increased). Parallel studies involving key enzymes (glutamic oxaloacetic transaminase, lactic dehydrogenase, and alkaline phosphatase) correlated with the aforementioned synthesis suggested that the effects of ozone, later demonstrable in the appearance of lung abnormalities, are first preceded by biochemical changes, all of which are related to cell injury. (Author)

A74-40899 # Nucleic acid content in the neuron-neuroglia system of the superoptic nucleus of the hypothalamus of hibernating Siberian marmots (Soderzhanie nukleinovykh kislot v sisteme neiron-neirogliia supraopticheskogo iadra gipotalamusa suslikov pri zimnei spiachke). L. Z. Pevzner (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR) and T. M. Semeshina (Akademiia Nauk SSSR, Institut Tsitologii i Genetiki, Novosibirsk, USSR). *Akademiia Nauk SSSR, Doklady*, vol. 216, June 21, 1974, p. 1429-1432. 9 refs. In Russian.

A74-40900 # Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./ (Sezonnaia dinamika absoliutnogo i otnositel'nogo vesa nadpochechnikov i urovnia 11-oksikortikosteroidov v perifericheskoi krovi krasnoshchekogo suslika /Citellus erythrogenis br./). B. Khabibov (Akademiia Nauk SSSR, Institut Tsitologii i Genetiki, Novosibirsk, USSR) and P. M. Krass (Akademiia Nauk Uzbekskoi SSR, Nukus, Uzbek SSR). *Akademiia Nauk SSSR, Doklady*, vol. 216, June 21, 1974, p. 1433-1435. 9 refs. In Russian.

A74-40903 The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle. S. S. Schäfer (Köln, Universität, Cologne, West Germany) and S. Kijewski (Göttingen, Universität, Göttingen, West Germany). *Pflügers Archiv*, vol. 350, no. 2, 1974, p. 101-122. 27 refs.

The discharge patterns of primary muscle spindle endings of M. triceps surae and M. tibialis anterior in the cat were recorded during ramp stretch of the two muscles. The initial acceleration peak in the discharge patterns of the spindles was investigated at different initial lengths of the respective muscle. The initial length of the muscle was increased stepwise to 2, 4, 6, and 8 mm, with ramp stretch being carried out from each position. The acceleration peak of spindles in M. triceps surae increases with increasing initial muscle length. At the same time, the duration of the peak becomes shorter in all spindles. Amplitude and duration of the acceleration peak of the spindles of M. tibialis anterior, on the other hand, are independent of the initial muscle length. The different behavior of spindles in these muscles is explained by their different anatomical and histological structure. It is concluded from these experiments that the initial spindle frequency peak represents the actual acceleration of that part of the muscle in which the spindle is embedded. (Author)

A74-40904 The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2. T. Hori and Y. Harada (Kumamoto University, Kumamoto, Japan). *Pflügers Archiv*, vol. 350, no. 2, 1974, p. 123-134. 26 refs. Research supported by the Ministry of Education of Japan.

The effects of ambient and hypothalamic temperatures were studied on the hyperthermic responses to prostaglandins E1 and E2 (PGE1 and PGE2) injected intraventricularly in the unanesthetized rabbit. Hyperthermic responses to PGE1 observed in different thermal environments were approximately equal in magnitude and time course. However, the prevailing ambient temperature influenced the thermoregulatory mechanisms by which the hyperthermia was achieved. In a hot environment, PGE1 hyperthermia was brought about by suppression of heat loss mechanism with little change in heat production. During cold exposure body temperature was raised mainly by an increase in heat production without a significant change in heat loss. PGE hyperthermias were attenuated by warming and enhanced by cooling the anterior hypothalamus. (Author)

STAR ENTRIES

N74-29444# *National Environmental Research Center, Research* Triangle Park, N.C. Human Studies Lab.
HEALTH CONSEQUENCES OF SULFUR OXIDES: A REPORT FROM CHESS, 1970-1971
May 1974 456 p refs
(EPA-650/1-74-004) Avail: NTIS HC $26.00

Epidemologic studies of the U.S. Environmental Protection Agency's Community Health and Environmental Surveillance System (CHESS) program provide dose-response information relating short-term and long-term pollutant exposures to adverse health effects. Results are presented of studies conducted in CHESS communities in New York and the Salt Lake Basin during 1970-1971. In addition, studies conducted in Idaho-Montana, Chicago, and Cincinnati, in which health indicators similar to those used in CHESS were employed, are included. Attention is focused on the health effects associated with sulfur oxides, but the relative contribution of various air pollutants, especially sulfur dioxide, total suspended particulates, and suspended sulfates, to observed disease frequencies is considered. Health indicators of long-term pollution effects employed in these studies included increased prevalence of chronic bronchitis in adults, increased acute lower respiratory infections in children, and increased acute respiratory illness in families. Author

N74-29445# Direction de la Meteorologie Nationale, Paris (France).
EVAPOTRANSPIRATION: AGROMETEOROLOGICAL ASPECT. PRACTICAL EVALUATION OF EVAPOTRANSPIRATION POTENTIAL [LEVAPOTRANSPIRATION: ASPECT AGROMETEOROLOGIQUE EVALUATION PRATIQUE DE LEVAPOTRANSPIRATION POTENTIELLE]
P. Brochet and N. Gerbier Mar. 1974 101 p refs In FRENCH
Avail: NTIS HC $8.25

A report was made on essential data concerning evapotranspiration, evapotranspiration potential, and the general function of water transfer between the soil, plants, and the atmosphere. The practical application of this data in agricultural regions is discussed. Formulas used to calculate the evapotranspiration potential are included. Transl. by E.H.W.

N74-29446*# Food and Drug Administration, Cincinnati, Ohio.
ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS Quarterly Report, 1 Oct. - 31 Dec. 1973
J. E. Campbell Feb. 1974 7 p
(NASA Order W-13411)
(NASA-CR-138895; QR-35) Avail: NTIS HC $4.00 CSCL 06M

Statistical considerations in designing sterilization experiments are discussed in terms of the basic design, pooling of runs, and process assessment. F.O.S.

N74-29447*# Techtran Corp., Glen Burnie, Md.
LIFE IN WEIGHTLESSNESS BIOLOGICAL LABORATORIES IN ORBIT
N. Zheleznov Washington NASA Jul. 1974 7 p Transl. into ENGLISH from Izv. (USSR), 1 Mar. 1974
(Contract NASw-2485)
(NASA-TT-F-15851) Avail: NTIS HC $4.00 CSCL 06S

The flight and experiments conducted aboard the cosmos-605 biosatellite are discussed. Several experiments were conducted with determination of the effect of weightlessness on various phylogenic categories of plants and animals. The experiments revealed weightlessness did not have a pathological effect on the animals, as compared with control specimens on earth, but did exert a deforming effect on fungi. Author

N74-29448*# Techtran Corp., Glen Burnie, Md.
THE SIGNIFICANCE OF CUMULATIVE CORIOLIS ACCELERATION FOR TESTS FOR EXPERT MEDICAL SELECTION
I. Ya. Yakovleva, V. P. Baranova, E. I. Matsnev, and A. Ya. Tizul Washington NASA Jul. 1974 8 p refs Transl. into ENGLISH from Vestn. Otorino-Laringol. (USSR), no. 1, Jan.-Feb. 1974 p 25-28
(Contract NASw-2485)
(NASA-TT-F-15824) Avail: NTIS HC $4.00 CSCL 06S

The results of the test for cumulation of coriolis accelerations in 376 men: 269 healthy and 107 with various somatic pathology are presented. Action tolerance was assessed by the data of clinical observations, ECG, arterial pressure, results of neuropathologist's examination and EEG. The test was tolerated excellently in 15%, well - in 14%, satisfactorily - in 20%, and poorly in 51% of cases. This test not only characterized vestibular stability, but also aided in detection of latent pathology: hypertensive reactions were revealed in 69 patients, hypertensive disease in 19, epilepsy undiagnosed before was revealed in 7 patients. Author

N74-29449# Naval Medical Field Research Lab., Camp Lejeune, N.C.
SYMPOSIUM ON HEAT STRESS AND HEAT ACCLIMATIZATION Medical Research Progress Report No. 4
Jesse F. Adams and John W. Johnson Apr. 1974 144 p refs Conf. held at Camp LeJeune, N. C., 12-13 Jun. 1973
(AD-777700) Avail: NTIS CSCL 06/19

A conference on heat stress, heat strain and heat acclimatization was convened. The conference attendees were a group of experts from the United States and abroad. The attendees were asked to discuss, on an informal basis, the physiologic and other criteria of heat stress and methods of measurement; the criteria and mechanisms of heat acclimatization and methods of measurement; the factors that should be studied in investigating the poorly acclimatizable or super acclimatizable individual; acceptable limits of pulse rate, body temperature or other parameters for humans working in heat; relationship of laboratory diagnosis of acclimatization with performance capability in the field. In addition, each conferee was asked to contribute his suggestions on areas of research in heat stress and heat acclimatization that would appear to be most promising and have highest priorities in military needs. (Modified author abstract) GRA

N74-29450# Army Foreign Science and Technology Center, Charlottesville, Va.
MATHEMATICAL MODEL OF BEHAVIOR DEVELOPED ON THE BASIS OF THE THEORY OF SET
V. V. Chavchanidze 31 Jan. 1974 7 p refs Transl. into ENGLISH from an unidentified RUSSIAN language article
(AD-776128; FSTC-HT-23-307-72) Avail: NTIS CSCL 05/10

A mathematical description of the example of psychophenomenon of set, the making of a decision, is given. This model (a psychotrome) is a system which includes two linked automations (hierarchic) working with various alphabets and forming a closed chain of reciprocal action and adapted adjustment. The experimental discovery of dynamic transfers between set states, the bringing out of a multitude of fixed set states and the structuring of an adequate cross-automatic model is a first step in the building of a general model of behavior. Author (GRA)

N74-29451# Naval Ordnance Lab., White Oak, Md.
NUMERICAL SOLUTION OF A DIFFUSION CONSUMPTION PROBLEM WITH A FREE BOUNDARY
Alan E. Berger, Melvyn Ciment, and Joel C. W. Rogers 31 Jan. 1974 63 p refs
(AD-778309; NOLTR-74-7) Avail: NTIS CSCL 06/16

The authors consider the numerical solution of an implicit moving free boundary problem which arises in the study of diffusion and consumption of oxygen in tissue. A fixed domain

numerical method is presented which is motivated by a theoretical formulation developed by Rogers. The numerical method uses any convenient finite difference or finite element scheme which converges to the underlying partial differential equation. The frontal generation appears by way of a simple algebraic comparison operation involving truncation of the computed approximation. Higher space dimensions are treated with equal ease. Results of numerical experiments are presented. A convergence proof for the truncation method is given. Author (GRA)

N74-29452*# Army Medical Lab. (361st), Chicago, Ill.
CIRCADIAN VARIATION IN PRESUMABLY HEALTHY YOUNG SOLDIERS
L. L. Kanabrocki, L. E. Scheving (Arkansas Univ., Little Rock), F. Halberg (Minnesota Univ., Minneapolis), R. L. Brewer, and T. J. Bird Feb. 1974 63 p
(Grants NGR-24-005-006; PHS-5-K6-GM-13)
(NASA-CR-139234; PB-228427/1) Avail: NTIS HC $3.75 CSCL 06P

A group of thirteen young soldiers was standardized for approximately thirty hours with rest time. Each man was sampled at three-hour intervals throughout one 24-hour period; this involved the measurement of oral temperature, radial pulse, blood pressure, intraocular pressure and minute ventilation. One year later another study was performed similarly on twelve men over a 72-hour period. A great majority of the many variables analyzed demonstrated a significant fit to a 24 hour cosine curve. From this same analysis, one was able to estimate three rhythmic parameters and their confidence limits; these included the acrophase (crest of best-fitting cosine), the amplitude and the mesor (computer-determined overall mean). The significance of these data is discussed. (Modified author abstract) GRA

N74-29453# George Washington Univ., Washington, D.C. Dept. of Science Communication.
OXYGEN TOXICITY
T. C. Schmidt and R. W. Hamilton, Jr. 21 Dec. 1973 50 p refs Prepared in part by Ocean Systems, Inc., Tarrytown, N. Y.
(Contract N00014-67-A-0214-0013)
(AD-779282; CRL-T-743) Avail: NTIS CSCL 06/20

Prolonged exposure to increased partial pressure of oxygen can result in toxic effects which become progressively more severe as the inspired partial pressure and/or duration of exposure is increased. The most dramatic of these are toxic effects upon the respiratory system (The Lorraine-Smith Effect) and upon the central nervous system (The Paul Bert Effect); as well as other toxic effects upon the body including destruction of red blood cells and the neurosensory tissues of the eye. Commonly recognized forms of oxygen toxicity are illustrated. GRA

N74-29454# Texas Univ., Austin. Applied Research Labs.
A COLLECTION OF TRANSLATIONS OF FOREIGN LANGUAGE PAPERS ON THE SUBJECT OF BIOLOGICAL SONAR SYSTEMS
K. Jerome Diercks Feb. 1974 274 p refs
(Contract N00123-73-C-0575)
(AD-778691; ARL-TR-74-9) Avail: NTIS CSCL 06/4

Contents: Research on the nervous echolocation mechanism in bats; Interaction of analyzers in dolphins during discrimination of geometrical figures under water; The location signals of bats native to the U.S.S.R.; The relationship between auditory perception and echolocation during hunting in Myotis oxygnathus; Types and formularies of experiments to be carried out in order to obtain comparative results; Mechanisms of overcoming interference in echolocating animals; Main directions in the evolution of locational systems in bats. GRA

N74-29455# Frankford Arsenal, Philadelphia, Pa.
THE HISTOPATHOLOGY OF CHORIORETINAL LESIONS PRODUCED BY THE GALLIUM ARSENIDE LASER
Dolph O. Adams, D. J. Lund, and Paul D. Shawaluk Oct. 1973 26 p refs
(DA Proj. 1T0-61102-A-31C; DA Proj. 3A0-6211-0-A-821)
(AD-778736; FA-M73-31-1) Avail: NTIS CSCL 06/18

The histopathology of chorioretinal lesions in the rhesus monkey produced by the gallium arsenide laser is discussed. The present studies do confirm previous ophthalmoscopic observation that round lesions are produced by the oval beam of the gallium arsenide laser. Healing of the lesions induced by the gallium arsenide laser is also discussed. Evidence of significant chorioretinal welding, fibrosis, or gliosis was not found. Author (GRA)

N74-29456# George Washington Univ., Washington, D.C. Dept. of Science Communication.
BREATHING MIXTURES
R. W. Hamilton, Jr. 29 Dec. 1973 93 p refs Prepared in cooperation with Ocean Systems, Inc., Tarrytown, N. Y.
(Contract N00014-67-A-0214-0013)
(AD-779302; CRL-T-750) Avail: NTIS CSCL 06/19

The report is concerned with the elements involved in the choice of breathing mixtures for diving. Two aspects are obligatory from the beginning, a diver's breathing gas must be supplied under pressure approximately equal to that of the divers' lungs, and all mixtures must contain oxygen. Beyond this the tradeoffs begin, and the ideal choice of gas is a compromise of several factors. These factors, oxygen toxicity, metabolism, inert gas narcosis, high pressure nervous syndrome, density, voice, thermal properties, decompression, fire safety, cost and logistics -- are covered. Current diving modes require the selection of optimal breathing mixtures for each of several operational situations. These include scuba, closed and semi-closed breathing rigs, hose-supplied gas, and the atmosphere of both submerisible and deck chambers; in addition to the equipment used, the particular diving situation affects the choice of gas. GRA

N74-29457# Freie Univ., Berlin (West Germany). Physiologisches Inst.
VOLUME CONDITIONED STIMULI AFFECTING SALT AND WATER EXCRETION Interim Scientific Report, 1 Jul. 1971 - 30 Nov. 1973
O. H. Gauer, K. Kirsch, and L. Lange 30 Jan. 1974 10 p refs
(Contract F44620-71-C-0117; AF Proj. 9777)
(AD-779781; AFOSR-74-0753TR) Avail: NTIS CSCL 06/19

The following investigations were conducted to analyze certain aspects of plasma volume control and simulated weightlessness by whole body immersion in a thermo-indifferent bath. Upon immersion the central venous pressure rises to about 15 mmHg. Rontgenometric studies reveal an increase of heart volume by 20 ml, when a standing subject was immersed. The effective compliance of the circulation of man was determined together with the compliance of the intrathoracic vascular compartment. The former is 2 - 3 ml/mmHg/kg, the latter 0.9 - 1.2 ml/mmHg/kg. Using radio-isotope techniques the redistribution of the extracellular fluid volume between interstitial fluid volume and plasma volume was investigated together with central venous pressure under various states of hydration. (Modified author abstract) GRA

N74-29458# Yale Univ., New Haven, Conn. Dept. of Biology.
MATHEMATICAL MODELS AND ELECTROPHYSIOLOGICAL STUDIES OF ECHOLOCATION Annual Report
Alvin Novick Feb. 1974 7 p refs
(Grant AF-AFOSR-2201-71; AF Proj. 9777)
(AD-779047; AFOSR-74-0751TR) Avail: NTIS CSCL 06/3

Studies of cochlear microphonic potentials during landing maneuvers were conducted with special focus on the degree of Doppler shift encountered in real flights and the exact placement of output frequencies and Doppler shifted echoes in reference to the bats sharply tuned ears. Data analyses are currently in progress. Theoretical analysis of bat sonars, in reference to CF as opposed to FM bats is continuing with publication of a paper on a model of wideband echolocation. Eight nerve audiograms were conducted with the aid of chronically implanted electrodes. The audiograms proved to be greatly different from the cochlear microphonic audiogram in the same bats. The on and the off audiograms both showed tuning to the fundamental, second harmonic and third harmonic of the sonar pulses as well as to

the elements of the FM sweeps and their harmonics but the tuning of the two curves is reciprocal. (Modified author abstract) GRA

N74-29459*# Essex Corp., Alexandria, Va.
MANIPULATOR SYSTEM MAN-MACHINE INTERFACE EVALUATION PROGRAM
Thomas B. Malone, Mark Kirkpatrick, and Nicholas L. Shields Jan. 1974 102 p
(Contract NAS8-28298)
(NASA-CR-120218; H-4-3) Avail: NTIS HC $8.25 CSCL 05H

Application and requirements for remote manipulator systems for future space missions were investigated. A manipulator evaluation program was established to study the effects of various systems parameters on operator performance of tasks necessary for remotely manned missions. The program and laboratory facilities are described. Evaluation criteria and philosophy are discussed. E.J.O.

N74-29460*# Virginia Univ., Charlottesville. Dept. of Engineering Science and Systems.
RIDE QUALITY EVALUATION 1: QUESTIONNAIRE STUDIES OF AIRLINE PASSENGER COMFORT
Larry G. Richards and Ira D. Jacobson Jul. 1974 58 p refs
(Grant NGR-47-005-181)
(NASA-CR-139368; Memo-403214) Avail: NTIS HC $6.00 CSCL 05E

As part of a larger effort to assess passenger comfort in aircraft, two questionnaires were administered: one to ground-based respondents; the other to passengers in flight. Respondents indicated the importance of various factors influencing their satisfaction with a trip, the perceived importance of various physical factors in determining their level of comfort, and the ease of time spent performing activities in flight. The in-flight sample also provided a rating of their level of comfort and of their willingness to fly again. Comfort ratings were examined in relation to (1) type of respondent, (2) type of aircraft, (3) characteristics of the passengers, (4) ease of performing activities, and (5) willingness to fly again. Author

N74-29461*# Methodist Hospital, Houston, Tex.
FABRICATION OF NEUROPHYSIOLOGICAL MONITORING SYSTEMS Final Report
James D. Frost, Jr. Washington NASA Jun. 1974 69 p
(Contract NAS9-13065)
(NASA-CR-2416) Avail: NTIS HC $3.75 CSCL 06B

A system designed to collect electroencephalographic, electro-oculographic, electromyographic, and head motion data is described. The portable instrumentation provides a rapid and simple means by which neurophysiological data can be obtained by the patient in his home and the taped data returned to the laboratory for analysis. The system was designed primarily for the study of sleep. Author

N74-29462*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A DESCRIPTION OF MODEL 3B OF THE MULTIPURPOSE VENTRICULAR ACTUATING SYSTEM
John A. Webb, Jr. Jun. 1974 48 p refs
(NASA-TM-X-71570; E-8009) Avail: NTIS HC $3.25 CSCL 06L

The multipurpose ventricular actuating system is a pneumatic signal generating device that provides controlled driving pressures for actuating pulsatile blood pumps. Overall system capabilities, the timing circuitry, and calibration instruction are included. Author

N74-29463*# Case Western Reserve Univ., Cleveland, Ohio. Engineering Desing Center.
MICROELECTRONIC BIOINSTRUMENTATION SYSTEM Annual Progress Report, Sep. 1973 - Aug. 1974
Wen H. Ko, Eugene T. Yon, and Ralph J. Rodriguez 27 Jul. 1974 59 p
(Grant NGR-36-027-053)
(NASA-CR-139216) Avail: NTIS HC $6.00 CSCL 06B

The progess made from April 1973 to June 1974 on a microelectronics bioinstrumentation system is reported and includes data for the following three individual projects: (1) a radio frequency powered implant telemetry system; (2) an ingestible temperature telemeter; and (3) development of pO2 and pH sensors. Proposed activities for continuation of the research for the period September 1, 1974 to August 31, 1975 are also discussed. A.A.D.

N74-29464*# Kanner (Leo) Associates, Redwood City, Calif.
FIELD OF VISION AND SIMPLE REACTION TIME DURING RECREATION EXERCISES AT WORK
T. Mieczkowski and S. Rotenberg Washington NASA Jul. 1974 13 p refs Transl. into ENGLISH from Wychowanie Fizyczne Sport (Poland), v. 9, no. 4, 1965 p 413-418
(Contract NASw-2481)
(NASA-TT-F-15828) Avail: NTIS HC $4.00

Measurements were made of the simple reaction time to sound and light stimuli and of the field of vision with respect to different colors in female telephone exchange operators performing and not performing recreation exercises during break periods. After 5 months, the simple reaction to both stimuli turned out to be shorter in the exercising group than in the control group. The loss in the field of vision with respect to the test colors was also smaller in the exercising group. The practice of recreation exercises increased the efficiency of the nerve centers and of the sight analyzer in the cerebral cortex. Author

N74-29465# Civil Aeromedical Inst., Oklahoma City, Okla.
PHYSIOLOGICAL RESPONSES IN AIR TRAFFIC CONTROL PERSONNEL: HOUSTON INTERCONTINENTAL TOWER
C. E. Melton, J. M. McKenzie, B. David Polis, Marlene Hoffman, and J. T. Saldivar, Jr. Dec. 1973 22 p refs Prepared in cooperation with Naval Air Development Center, Warminster, Pa.
(AD-777838; FAA-AM-73-21) Avail: NTIS CSCL 06/19

Biochemical and physiological indices of stress showed that the level of stress of 16 air traffic controllers at the Houston Intercontinental Airport Tower was indistinguishable from that of control populations. While the level of stress was lower than that among O'Hare Tower controllers, both groups showed about the same degree of adaptation. Day work (heavy traffic load) at Houston was characterized by elevated levels of all stress indicators as compared with the mid-shift (light traffic): epinephrine excretion increased significantly during the last half of the mid-shift as compared with the first half. Urinary stress indicators (17-ketogenic steroids, epinephrine, norepinephrine) were all significantly elevated during day sleep as compared with night sleep, indicating less effective rest during day sleep. (Modified author abstract) GRA

N74-29466# Texas Technological Univ., Lubbock. Center of Biotechnology and Human Performance.
PERFORMANCE, RECOVERY AND MAN-MACHINE EFFECTIVENESS Final Report, 1 Sep. 1968 - 31 Nov. 1973
Clay E. George and Richard A. Dudek Apr. 1974 73 p refs
(Contract DAAG05-69-C-0102; DA Proj. 1T0-14501-B-81A; Proj. Themis)
(AD-777797; HEL-TM-9-74) Avail: NTIS CSCL 05/5

Five years of research directed to the problem of continuous operations are summarized. Performance changes were studied in vibrating and heated environments, under varying organizational structures and for different work-rest schedules. Physiological response was studied for various work periods, work-rest schedules, heat levels and organizational roles. Results indicate that healthy young men can work safely and effectively for extensive periods of time given certain conditions. The necessary conditions include adequate nutritional intake, change of pace activities and at least brief periods of intermittent rest. Author (GRA)

N74-29467# Air Force Human Resources Lab., Brooks AFB, Tex.
FEASIBILITY OF USING SPECIAL MEASURES IN THE CLASSIFICATION AND ASSIGNMENT OF LOWER MENTAL ABILITY AIRMEN
James M. Wilbourn and Nancy Guinn Nov. 1973 22 p refs
(AF Proj. 7718)
(AD-777831; AFHRL-TR-73-31) Avail: NTIS CSCL 05/9

A battery of eleven non-verbal tests were administered. The number of significant relationships between certain non-verbal tests and final technical school grade varied as a function of mental category and career field. On cross-validation the number of significant relationships between the non-verbal composite and final school grade were reduced to four total group courses and one lower ability group course. When added to the selector Aptitude Index (AI), the non-verbal tests made a significant and unique contribution to the prediction of technical school success over and beyond the selector AI alone. Results indicate that the use of non-verbal tests as well as other aptitudinal and educational data could make a significant contribution if added to the operational selection and classification battery. (Modified author abstract) GRA

N74-29468# Frankford Arsenal, Philadelphia, Pa.
EVALUATION OF AIR FORCE LASER PROTECTIVE DEVICES
Alan H. Blumenthal and James J. Mikula Nov. 1973 51 p refs
(AD-779522; FA-R-2098) Avail: NTIS CSCL 06/17

Different types of experimental Air Force laser absorbers were evaluated as eye protective devices against laser radiation. They consisted of a light green neodymium specific Polymethyl Methacrylate (PMMA) visor, dark blue ruby-specific PMMA visor, light orange argon ion-specific PMMA visor, light blue anti-red PMMA visor, dark orange multilaser PMMA visor for protection against ruby and HeNe, dark orange multilaser PMMA visor for protection against UV, argon ion, frequency doubled Nd, GaAs and neodymium, multilaser spectacle goggles made of cellulose propionate, broadband IR-protection PMMA plates, and broadband IR protection CP goggle lenses. Results of optical density measurements at conventional low light levels and Q-switch laser powers are compared for bleaching and maintenance of desired attenuation. (Modified author abstract) GRA

N74-29469# Human Engineering Labs., Aberdeen Proving Ground, Md.
SUMMARY OF THE HUMAN ENGINEERING LABORATORY'S AIR-TO-GROUND TARGET DETECTION STUDIES USING STATIONARY TARGETS Final Technical Note
Mar. 1974 12 p refs
(AD-779409; HEL-TN-5-74) Avail: NTIS CSCL 05/5

Recent events have increased interest in the ranges at which the helicopter crewman can be expected to detect and/or identify a target. Studies of air-to-ground target detection identification have all concluded with essentially the same results: a stationary, passive, noncamouflaged military ordnance type of target can be detected by an observer in a slow speed, 60 knots, low flying, less than 300 feet, helicopter at maximum ranges up to 2000 meters but cannot be reliably identified at ranges greater than 1000 meters. GRA

N74-29470# Frankford Arsenal, Philadelphia, Pa.
THE USE OF DYNAMIC FILTERING AS A MEANS OF LASER EYE PROTECTION
Alan H. Blumenthal, Robert W. Anderson, Jr., and James J. Mikula Dec. 1973 18 p
(DA Proj. 1J6-62713-D-40)
(AD-779555; FA-R-3000) Avail: NTIS CSCL 06/17

With the growing uses and new developments in the field of laser radiation it has become increasingly vital to perfect an eye protection device for the safety of industrial workers and combat troops. An ideal dynamic filter has high visible transmittance at ordinary light levels and high optical density at increased laser powers. This is accomplished with a three level system. Absorption of laser radiation would populate an excited singlet state. If the decay to the ground state is slow and a higher excited singlet, of the proper energy separation, exists with a sufficiently large extinction coefficient, then dynamic filtering will take place. Heptaphene, phthalocyanine aluminum chloride, Sudanblack B, and Indanthrone have shown an increase in optical density over that of the ground state when subjected to a Q-switched laser. (Modified author abstract) GRA

N74-29471# Life Sciences, Inc., Hurst, Tex.
AN EXPERIMENTAL INVESTIGATION OF THE ROLE OF MOTION IN GROUND-BASED TRAINERS Final Report, Dec. 1970 - Jun. 1973
W. G. Matheny, A. L. Lowes, and J. A. Bynum Apr. 1974 67 p refs
(Contract N61339-71-C-0075)
(AD-778665; NAVTRAEQUIPC-71-C-0075-1) Avail: NTIS CSCL 05/9

The experience of users of motion simulators for training has lead to the conclusion that motion is beneficial to transfer of training. However, there is need for data relevant to the question, how much motion should be used. The purpose of the study was to provide data relevant to the specification of motion requirements for ground-based trainers for aircraft pilots. The study investigated three categories of motion: no motion, motion correlated with the output of the aircraft equations and visual displays, and random uncorrelated motion. Both man-machine system output measures, and operator output measures were used as measures of performance in studying the effects of the experimental conditions. (Modified author abstract) GRA

N74-29799* Kanner (Leo) Associates, Redwood City, Calif.
CONSTRUCTION OF A MATHEMATICAL MODEL OF THE HUMAN BODY, TAKING THE NONLINEAR RIGIDITY OF THE SPINE INTO ACCOUNT
K. K. Glukharev, N. I. Morozova, B. A. Potemkin, V. S. Solovyev, and K. V. Frolov *In its* Cybernetic Diagnostics of Mech. Systems with Vibro-acoustic Phenomena (NASA-TT-F-14899) Jun. 1973 p 38-40 refs Transl. into ENGLISH from the book "Kiberneticheskaya Diagnostika Mekhanicheskikh Sistem po Vibroakusticheskim Protsessam" Kaunas, KPI Press, 1972 p 37-38

CSCL 06P

A mathematical model of the human body was constructed, under the action of harmonic vibrations, in the 2.5-7 Hz frequency range. In this frequency range, the model of the human body as a vibrating system, with concentrated parameters is considered. Vertical movements of the seat and vertical components of vibrations of the human body are investigated. Author

N74-29811* Kanner (Leo) Associates, Redwood City, Calif.
THE USE OF A DIGITAL COMPUTER FOR INVESTIGATION OF THE DYNAMIC CHARACTERISTICS OF A MAN WHILE PRESSING VERTICALLY DOWNWARD WITH THE STRAIGHT ARM ON THE HANDLE OF A VIBRATOR (INSTRUMENT)
A. I. Zazhivikhina, G. S. Rosin, and Ye. I. Ryzhov *In its* Cybernetic Diagnostics of Mech. Systems with Vibro-acoustic Phenomena (NASA-TT-F-14899) Jun. 1973 p 83-86 ref Transl. into ENGLISH from the book "Kiberneticheskaya Diagnostika Mekhanicheskikh Sistem po Vibroakusticheskim Protsessam" Kaunas, KPI Press, 1972 p 78-81
CSCL 05E

The dynamic characteristics of a man were investigated by the resonance method, by means of recordings of the amplitude-frequency characteristics of a vibrator straight arm human body system on a standard automatic recorder. Experiments were carried out with a specially constructed vibrator, the moving system of which was fastened to a bronze suspension with small losses. Vibrations of the handle, fastened to the moving system, were recorded with an accelerometer. The mass of the moving system m, rigidity of the suspension k and friction coefficient r of the vibrator (calibration) were determined by exact formulas. Author

N74-29914* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ROLE OF GRAVITY IN PREPARATIVE ELECTROPHORESIS

M. Bier (Arizona Univ., Tucson), J. O. N. Hinckley (Arizona Univ., Tucson), A. J. K. Smolka (Arizona Univ., Tucson), M. J. Binder (Arizona Univ., Tucson), M. Coxon (Arizona Univ., Tucson), T. W. Nee (Arizona Univ., Tucson), M. O. Scully (Arizona Univ., Tucson), H. S. T. Shih (Arizona Univ., Tucson), and R. S. Snyder *In its* Proc. of the 3d Space Processing Symp. on Skylab Results, Vol. 2 Jun. 1974 p 729-253 refs

CSCL 06C

Electrophoresis has contributed significantly to the methodology of biological sciences, and shows the potential for large scale fractionation of a wide range of medically important substances, including living cells. Gravity plays an important role in the electrophoretic process, and hence the importance of the NASA effort to develop a zero-gravity separation facility as part of its shuttle program. The current state of art in electrophoresis is reviewed with particular emphasis on the role of gravity and the possible use of istachophoresis. This technique utilizes a discontinuous buffer system, and appears to be the only high resolution electrophoretic technique currently available for separation of living cells. Author

N74-29915* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PREPARATIVE ELECTROPHORESIS OF LIVING LYMPHOCYTES

C. J. VanOss (State Univ. of New York, Buffalo), P. E. Bigazzi (State Univ. of New York, Buffalo), C. F. Gillman (State Univ. of New York, Buffalo), and R. E. Allen *In its* Proc. of the 3d Space Processing Symp. on Skylab Results, Vol. 2 Jun. 1974 p 755-762 refs
(Contract NAS8-29745)
CSCL 06C

Vertical liquid columns containing low molecular weight dextran density gradients can be used for preparative lymphocyte electrophoresis on earth, in simulation of 0 gravity conditions. Another method that has been tested at 1 G, is the electrophoresis of lymphocytes in a upward direction in vertical columns. By both methods up to 10 to the 7th power lymphocytes can be separated at one time in a 30 cm glass column of 8 mm inside diameter, at 12 v/cm, in 2 hours. Due to convection and sedimentation problems, the separation at 1 G is less than ideal, but it is expected that at 0 gravity electrophoresis will prove to be a uniquely powerful cell separation tool. The technical feasibility of electrophoresing inert particles at 0 G has been proven earlier, during the flight of Apollo 16. Author

N74-30454 British Library Lending Div., Boston Spa (England).
ASSESSING THE ABUNDANCE AND BIOMASS OF PHYTOPLANKTON BY MEANS OF ELECTRONIC COMPUTERS
E. I. Aksenova and V. I. Poltinnikov Mar. 1974 19 p refs Transl. into ENGLISH from Tr. Vses. Nauch.-Issled. Morsk. Ryb. Khoz. Okeanogr. (USSR), v. 89, 1972 p 209-226
(BLL-RTS-8914) Avail: British Library Lending Div., Boston Spa, Engl.: 6 BLL photocopy coupons

The geometrical approximations used to create a computer program for the evaluation of phytoplankton biomass in the Asov Sea are presented. The selection of 47 geometrical figures representing the 496 principal algae which occur in the Asov basin served as a basis for the creation of a computer code, and also provided a standard method for comparing the data to previous research. The program algorithm used to assess the biomass by genera, species, division, and total mass is explained for each of its four successive operations. Examples of initial data are given, and preliminary results are shown in tabular form. A.A.D.

N74-30455 Ohio State Univ., Columbus.
A THEORETICAL STUDY OF GAITS FOR LEGGED LOCOMOTION SYSTEMS Ph.D. Thesis
Shu-Shen Sun 1974 164 p
Avail: Univ. Microfilms Order No. 74-17811

A fundamental research area in the study of natural or artificial legged locomotion systems is the investigation of time sequences (or gaits) for the placing and lifting of the legs of an animal or machine during its motion. Gaits for biped and quadruped systems have been studied. Compared to the possible gaits for systems with six or more legs, biped and quadruped systems are relatively simple to analyze and some useful and concrete results have been derived by previous investigators. It has been found that the theoretically possible number of gaits is surprisingly large as the number of legs is increased, and the need for more formal and systematic means of analysis has been recognized. This research is aimed at the development of a general method to reduce the combinatorial complexity of gait analysis by making use of certain concepts of equivalence classes of gaits, and to then use these classes for the study of optimal gaits which provide the greatest degree of system stability. Dissert. Abstr.

N74-30456 British Library Lending Div., Boston Spa (England).
HOW SPACE MEDICINE HELPS TERRESTRIAL
N. Gurovsky and A. Yegorov 17 Jan. 1974 5 p Transl. into ENGLISH from Izvestia (USSR), 4 Jan. 1974
(BLL-M-23364-(5828.4F)) Avail: British Library Lending Div., Boston Spa, Engl.: 1 BLL photocopy coupon

Applications of space medicine to clinical practices are briefly discussed for biotelemetry. F.O.S.

N74-30457 British Library Lending Div., Boston Spa (England).
GRAVITATIONAL BIOLOGY
N. Dubinin 1 Feb. 1974 4 p Transl. into ENGLISH from Pravda (USSR), 6 Jan. 1974
(BLL-M-23358-(5828.4F)) Avail: British Library Lending Div., Boston Spa, Engl.: 1 BLL photocopy coupon

The effects of gravitation on organisms on the earth surface and in weightless environments are discussed with emphasis on the effect of space flight on genetic structures and the resulting mutations. F.O.S.

N74-30459 British Library Lending Div., Boston Spa (England).
BIOLOGIST'S QUESTIONS TO SPACE
A. Burnazyan [1974] 5 p Transl. into ENGLISH from Pravda (USSR), 9 Nov. 1973
(BLL-M-23267-(5828.4F)) Avail: British Library Lending Div., Boston Spa, Engl.: 1 BLL photocopy coupon

The importance of biological research in conjunction with space exploration is discussed. Current studies in the U.S.S.R., with particular reference to Cosmos 605, are outlined. Attention is given to questions pertaining to the role of the force of gravity in the functioning of living systems, the origin and nature of biological rhythms, biomagnetism, and the adaptation of living organisms to prolonged states of weightlessness. A.A.D.

N74-30460# British Library Lending Div., Boston Spa (England).
PHOTORESPIRATION AND THE PRIMARY REACTIONS OF PHOTOSYNTHESIS
B. Loetsch [1974] 22 p refs Transl. into ENGLISH from Ber. Deut. Bot. Ges. (West Germany), v. 83, no. 2, 1970 p 41-54
(BLL-DRIC-Trans-3293-(3623.66)) Avail: British Library Lending Div., Boston Spa, Engl.: 3 BLL photocopy coupons

Under suitable experimental conditions, it is possible to demonstrate a light-dependent carbon dioxide production (and oxygen consumption) in higher plants. This so-called photorespiration is not connected with mitochondrial respiration (which seems

to be even inhibited in light), but is closely related to the primary reactions of photosynthesis. To clarify this connection with the light driven electron flow, a comparative biological demonstration of the much discussed two quantum scheme of photosynthesis is presented. As a result, it is not clear that an automatic coupling of the photochemical splitting of water (to produce reduction energy) with the non-cyclic photo-phosphorylation (to gain energy as ATP) has emerged in the course of biological evolution.
Author

N74-30461*# California Univ., Davis. Dept. of Animal and Human Physiology.
CORRELATION OF HIPPOCAMPAL THETA RHYTHM WITH CHANGES IN CUTANEOUS TEMPERATURE
J. M. Horowitz, M. A. Saleh, and R. D. Karem [1974] 25 p refs
(Grants NGR-05-004-099; NGL-05-004-031; HO-6686)
(NASA-CR-139527) Avail: NTIS HC $4.25 CSCL 06C

A possible role for the hippocampus in alerting an animal to changes in cutaneous temperature was examined. Following local warming or cooling of the ears of unanesthetized, loosely restrained rabbits, theta waves (4-7 Hz EEG waves) were recorded from electrodes straddling the hippocampus. The onset of the hippocampal theta rhythm was correlated with changes in cutaneous temperature, an observation consistent with studies indicating that the theta rhythm is a nonspecific response evoked by stimulation of several sensory modalities. Additional data from cats and rabbits were correlated with specific neurons within the hippocampus, namely pyramidal cells. Post stimulus time histograms obtained by excitation of the dorsal fornix were interpreted in terms of excitatory and inhibitory inputs to pyramidal cells. Thus, the theta rhythm, which appears to be evoked by changes in cutaneous temperature, can be related to a specific type of hippocampal neuron which is in turn connected with other areas of the brain involved in temperature regulation.
Author

N74-30462*# California Univ., Davis. Dept. of Human and Animal Physiology.
CORRELATION OF THE HIPPOCAMPAL THETA RHYTHM TO CHANGES IN HYPOTHALAMIC TEMPERATURE Final Technical Report
M. A. Saleh, J. M. Horowitz, and Arnold C. L. Hsieh [1974] 26 p refs
(Grants NGL-05-004-099; NGL-05-004-031; HO-6686)
(NASA-CR-139526) Avail: NTIS HC $4.50 CSCL 06C

Warming and cooling the preoptic anterior hypothalamic area in awake, loosely restrained rabbits was found to evoke theta rhythm. This is consistent with previous studies indicating that theta rhythm is a nonspecific response evoked by stimulation of several sensory modalities. Several studies have correlated theta rhythm with alertness. A neural pathway involving the hypothalamus, the hippocampus, the septal area, and the reticular formation is proposed. Thus, a role of this pathway may be to alert the animal to changes in its body temperature.
Author

N74-30463*# Saad (Geti), Karachi (Pakistan).
PERIODIC (SEASONAL AND YEARLY) CHANGES IN THE ORGANISM OF RATS: THEIR CAUSES AND EFFECTS
N. I. Kalabukhov Washington NASA Aug. 1974 612 p refs Transl. into ENGLISH of the book "Periodicheskiye (Sezonnyye i Godichnyye) Izmeneniya v Organizme Gryzunov: Ikh Prichiny i Posledstviya" Leningrad, Nauka Press, 1969 p 1-249 Sponsored in part by NASA
(Grant NSF C-505)
(NASA-TT-F-14101) Avail: NTIS HC $33.75 CSCL 06C

Data are presented about the changes in forest, steppe, and desert rodents of various species, which take place in different seasons of the year under the influence of external conditions. The adaptation significance of these changes is discussed. This knowledge about the seasonal changes in the rodents will help in controlling rodents.
Author

N74-30464*# Saad (Geti), Karachi (Pakistan).
ECOLOGICAL PHYSIOLOGY OF ANIMALS
A. D. Slonim Washington NASA Aug. 1974 693 p refs Transl. into ENGLISH of the book "Ekologicheskaya Fiziologiya Zhivotnykh" Moscow, Vysshaya Shkola Press, 1971 p 1-448
(Contract NSF C-505)
(NASA-TT-F-14203) Avail: NTIS HC $37.75 CSCL 06C

Physiological adjustments, in higher organisms, to the factors of the natural environment were studied along with the micro-evolution of functions. The adaptation of the organism was investigated at various levels of physiological integration related to the reaction of the organism. Separate functions were examined for the appearance of modifications resulting from genetics, or in the individual span of life. Topics discussed include: the mechanisms of physiological natural adaptation, inherited and acquired behavior, periodical changes of physiological processes, temperature effects of the habitat, adaptation to food supply, movement in the environment, and herd and population relations.
F.O.S.

N74-30465*# Kanner (Leo) Associates, Redwood City, Calif.
THE ENERGY ASPECT OF THE MECHANISM OF ENZYME ACTION
J. Tonnelat Washington NASA Aug. 1974 34 p refs Transl. into ENGLISH from Biochimie (France), v. 56, 1974 p 21-34
(Contract NASw-2481)
(NASA-TT-F-15835) Avail: NTIS HC $4.75 CSCL 06A

The nature of the phenomena responsible for the need for activation energy in a chemical reaction is examined. These phenomena basically result from electrostatic interactions, and there is no way to decrease the total work required to overcome these interactions, but work can be supplied in several steps. The fractioning of a reaction induced by the intervention of an enzyme substantially accelerates its rate due to the exponential decrease in the number of molecules with their energy level of thermal agitation. An example is given for arbitrary free activation energy values. The chief function of an enzyme is to ensure satisfactory coordination of successive steps.
Author

N74-30466*# Kanner (Leo) Associates, Redwood City, Calif.
STUDY OF ANTINUCLEAR ANTIBODIES IN SUBJECTS WITH PHOTODERMATITIS
F. Ippolito and P. G. Natali Washington NASA Aug. 1974 5 p Transl. into ENGLISH from G. Ital. Dermatol. (Italy), v. 109, no. 2, 1974 p 124-125
(Contract NASw-2481)
(NASA-TT-F-15844) Avail: NTIS HC $4.00 CSCL 06P

Recent studies have shown that it is possible to elicit in experimental animals an antibody response to molecules of nucleic acids irradiated with ultraviolet light. The antibodies obtained show an elective specificity for the photoproducts of the thymic base of deoxyribonucleic acid. The use of these antibodies in indirect immunofluorescence methods has been a valuable aid in studying the effects of ultraviolet irradiation on animals exposed in vivo to such radiant energies. It was ascertained that the nuclei of the cutaneous cells of animals exposed to ultraviolet light undergo a temporary denaturation, which can be revealed with the use of antisera specific for UV-DNA.
Author

N74-30467*# Linguistic Systems, Inc., Cambridge, Mass.
EVOLUTION OF THE GRAVIRECEPTOR AND ITS INVESTIGATION UNDER CONDITIONS OF ACCELERATION AND WEIGHTLESSNESS
Ya. A. Vinnikov Washington NASA Jul. 1974 38 p refs Transl. into ENGLISH from Arkh. Anatomii, Gistol. i Embriol. (USSR), v. 66, no. 1, 1974 p 10-25
(Contract NASw-2482)
(NASA-TT-F-15574) Avail: NTIS HC $5.00 CSCL 06C

Previous work conducted on the evolution of the mechanism of gravity reception in invertebrates and vertebrates. The structure of this mechanism in various organisms from protozoa to mollusks and crabs is described by means of numerous electron microscopic photographs. According to the analysis, this structure was retained in the vertebrates, and developed apparently in direct relation to the complexity of their muscular structure and interrelation with the earth's gravity. The effects of linear acceleration and weightlessness on its development are discussed; linear accelerations of 10 g for three minutes were created to stimulate utriculus

receptor cells and those of the sacculus and semicircular canals, with considerable alterations in nuclear and cytoplasmic organization being observed. Experiments done on Soyuz-10 are described. Author

N74-30468*# Kanner (Leo) Associates, Redwood City, Calif.
MEAN LUNG CAPACITY UNDER INCREASED O2 DEMAND
E. Asmussen and E. H. Christensen Washington NASA Aug. 1974 12 p refs Transl. into ENGLISH from Skand. Arch. Physiol., (Denmark), v. 82, 1939 p 201-212
(Contract NASw-2481)
(NASA-TT-F-15598) Avail: NTIS HC $4.00 CSCL 06P

The respiration of four subjects exercising on a bicycle ergometer was studied in a steady state both at atmospheric pressure and at reduced pressure and compared with respiration at rest. In contrast to the opinions of several earlier researchers, no general increase in mean capacity was found during work. Verzar's hypothesis of a third form of regulation thus appears to be incorrect. Author

N74-30469*# Linguistic Systems, Inc., Cambridge, Mass.
THE INFLUENCE OF A ZERO-CALORIE DIET ON CARDIAC PERFORMANCE IN OVERWEIGHT WOMEN WITH NORMAL CIRCULATORY SYSTEMS
K. Bolzano, H. J. Lisch, A. Aigner, F. Sandhofer, and S. Sailer Washington NASA Jun. 1974 17 p refs Transl. into ENGLISH from Wien. Klin. Wochenschr. (Austria), v. 85, Oct. 1973 p 667-661
(Contract NASw-2482)
(NASA-TT-F-15711) Avail: NTIS HC $4.00 CSCL 06P

Fasts of two weeks are employed to reduce overweight in 9 obese, but otherwise healthy women. Before treatment and at the end of the first and second week of total starvation, serum electrolytes, total serum protein, and acidbase status were measured. The ejection fraction and index of myocardial contractility were calculated based on systolic time intervals. During starvation significant reduction in left ventricular ejection time was observed as well as prolongation of pre-ejection period and external isovolumic contraction time. After two weeks significant reduction in ejection fraction occurred and the index of myocardial contractility was significantly depressed. The serum K+ concentration shifted to lowered values. It is suggested that total therapeutic starvation of relatively short duration may cause reduction in myocardial contractility of the left ventricle. Author

N74-30470*# Scientific Translation Service, Santa Barbara, Calif.
ON THE QUESTION OF PILOT DETERIORATION DURING LOW ALTITUDE FLIGHT
P. Schulz Washington NASA Jul. 1974 20 p refs Transl. into ENGLISH from the German report DLR-Mitt-70-12 Presented at the meeting of the DGLR Sci. Comm. on Flight Performance and Flight Characteristics, Darmstadt, 12-13 Nov. 1970
(Contract NASw-2483)
(NASA-TT-F-15799; DLR-Mitt-70-12) Avail: NTIS HC $4.00 CSCL 06S

The problem of pilot performance estimates during the aircraft design phase is discussed. The following are found to influence such estimates: low altitude turbulence model, aircraft model, mission model and pilot response model. Pilot responses to stochastic gust disturbances are evaluated and the aircraft transfer functions are calculated. Flight controllers are needed for low altitude flight. Elastic degrees of aircraft motion should be included in the calculation. Author

N74-30471*# Techtran Corp., Glen Burnie, Md.
PREDICTING RESISTANCE TO G-FORCES BY THE AID OF A DECOMPRESSION FUNCTIONAL TEST
V. G. Voloshin, P. M. Suvorov, A. R. Kotovskaya, and R. A. Vartbaronov Washington NASA Jul. 1974 9 p Transl. into ENGLISH from Voyenno-Med. Zh. (USSR), no. 5, May 1974 p 56-59
(Contract NASw-2485)
(NASA-TT-F-15823) Avail: NTIS HC $4.00 CSCL 06S

An examination was made of the suitability of a method of decompressing the lower half of the body for the purpose of determining pilot's resistance to positive g-forces. Data are introduced on the correlation between resistance to positive g-forces and findings of the decompression studies. It is found that decompression can serve as a good method of determining resistance to g-forces if some shortcomings are eliminated and a further study is made for the exact degree of coincidence of resistance levels according to the two methods. Author

N74-30472*# Scientific Translation Service, Santa Barbara, Calif.
RESPIRATORY AND RIGHT HEART FUNCTION IN DIFFERENT TYPES OF OBESE PATIENTS
J. Meunier-Carus, E. Lampert, J. Lonsdorfer, D. Kurtz, and G. Micheletti Washington NASA Aug. 1974 30 p refs Transl. into ENGLISH from Bull. Physio-Pat-hol. Resp. (France), v. 8, 1972 p 915-935
(Contract NASw-2483)
(NASA-TT-F-15827) Avail: NTIS HC $4.50 CSCL 06P

Eighty seven parameters of respiratory and right heart function, obtained either by direct measurement or by calculation, were measured in 63 obese patients and in a group of 17 nonobese bronchitics, the latter being used for comparative purposes. The obese patients were divided into groups according to the presence or absence of sleep disorders, the presence or absence of alveolar hypoventilation or the presence of chronic bronchitis. Twenty-nine of the parameters studied showed statistical and physiologically significant differences between the groups of obese patients, permitting the definition of a physiopathological profile for each one. This profile was characterized by specific elements relating to ventilation, gas exchange, ventilation/perfusion distribution and right-sided cardio-circulatory function. These pathophysiological labels, particular to each type of obesity, were largely determined by the presence and dominant action of the mechanism of thoracic mechanics peculiar to each. The importance in obesity of ventilatory and mechanical problems, gas exchange and ventilation/perfusion distribution, as well as of rightsided cardiac haemodynamics, are also discussed in the light of the findings. Author

N74-30473*# Kanner (Leo) Associates, Redwood City, Calif.
TREATMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS WITH AZATHIOPRINE
E. Sharon Washington NASA Aug. 1974 7 p refs Transl. into ENGLISH from Harefuah (Tel Aviv), v. 86, no. 7, 1974 p 382-384
(Contract NASw-2481)
(NASA-TT-F-15840) Avail: NTIS HC $4.00 CSCL 06E

A brief history of experiments on the use of azathioprine in the treatment of patients with systemic lupus erythematosus with kidney involvement has demonstrated azathioprine's effectiveness. Azathioprine has two main characteristics: immunologic and cytotoxic depression activity and anti-inflammation activity. In dosages of 2.5 mg/kg/day, azathioprine is tolerated well by patients, producing few side effects, possible depression of the marrow which is easily reversible, and no toxic side effects of the steroids. Discontinuation must be gradual to avoid aggravation of the disease. Author

N74-30474*# Techtran Corp., Glen Burnie, Md.
ADAPTATION AS A FACTOR MODIFYING THE STABILITY OF ENZYMES
V. I. Maksimov Washington NASA Apr. 1974 21 p refs Transl. into ENGLISH from Usp. Sovrem. Biol. (Moscow), v. 76, no. 1 (4), 1973 p 21-33
(Contract NASw-2485)
(NASA-TT-F-15505) Avail: NTIS HC $4.25 CSCL 06D

Materials published chiefly in recent years on the features of the stability of thermophilic, halophilic, and other enzymes are surveyed. It has recently become possible to analyze the question of genetic control of enzyme stability at the molecular level (level of enzyme molecular structure). Although study of the mechanism of adaptation of enzyme stability to cell existence conditions is not complete, extant enzymological experimental materials permit the making of certain adjustments in the concept of the general mechanisms of enzyme stability. As an example, the theory of hydrophobic interaction cannot explain the variability observed in enzyme stability. The data assembled on

the exceptional stability of a number of enzymes may be of value for laboratory and industrial derivation and use of enzymes. Author

N74-30475*# North Texas State Univ., Denton. Dept. of Biological Sciences.
ALTERATIONS IN CELLULAR AND METABOLIC PROCESSES Final Report
Tom D. Rogers Aug. 1974 69 p refs
(Grant NGR-44-027-005)
(NASA-CR-139398) Avail: NTIS CSCL 06M

Results of the use of specialized instrumention to obtain specific biochemical and morphological information is reported. The research reported includes: alteration in cellular and metabolic processes, microspectrophotometric analysis of the cell cycle, cytophotometry of virus-infected culture cells, rapid scanning microspectrophotometry of colorless Euglena gracilis and Astasia longa, and the intracellular quantitation of lactate dehyrogenase in colorless Euglena gracilis and Astasia longa. F.O.S.

N74-30476*# Illinois Univ., Urbana. Dept. of Civil Engineering.
TOPOGRAPHY OF AORTIC HEART VALVES Final Report
H. M. Karara 1 Aug. 1974 38 p refs
(Contract NAS9-12459)
(NASA-CR-139566; UILU-ENG-74-2017) Avail: NTIS HC $5.00 CSCL 06P

The cooperative effort towards the development of a tri-leaflet prosthetic heart valve is described. The photogrammetric studies were conducted on silicone rubber molds. Information on data acquisition and data reduction phases is given, and certain accuracy aspects of the project are explained. The various outputs which are discussed include digital models, profiles, and contour maps. Author

N74-30477*# Hardin-Simmons Univ., Abilene, Tex. Dept. of Biology
A STUDY OF PSYCHROPHILIC ORGANISMS ISOLATED FROM THE MANUFACTURE AND ASSEMBLY AREAS OF SPACECRAFT TO BE USED IN THE VIKING MISSION Semiannual Progress Report, 1 Jan. - 30 Jun. 1974
Terry L. Foster Jul. 1974 37 p
(Grant NGR-44-095-001)
(NASA-CR-139390; SAPR-4) Avail: NTIS HC $5.00 CSCL 06M

The effect of storage of dry heat treated Teflon ribbons under nitrogen gas followed by high vacuum on the recovery of hardy organisms from the ribbons was studied. A similar experiment was performed on spore crops of hardy organisms recovered previously from Cape Canaveral. Hardy organisms have been inoculated onto slides and subjected to an artificial Martian environment in an attempt to demonstrate their growth in this environment. Additional experiments using the artificial Martian environment include response of soil samples from the VAB with both constant temperature and freeze-thaw cycles. These experiments were performed with dried soil and soil containing added water. Other investigations included the effect of heatshock on soil samples, psychrophilic counts of new soil samples from the manufacture area of the Viking spacecraft, effect of pour plate versus spread plate on psychrophilic counts, and preparation of spore crops of hardy organisms from Cape Canaveral. Author

N74-30478# Joint Publications Research Service, Arlington, Va.
ELECTROMAGNETIC SIGNALING IN ANIMATE NATURE
A. S. Presman 10 Jul. 1974 68 p refs Transl. into ENGLISH of the book "Elektromagnitnaya Signalizatsiya v Zhivoy Prirode" USSR, Izdatekstvo Sovetskoye Radio, 1974 p 1-63
(JPRS-62434) Avail: NTIS HC $6.50

One of the prospective new areas in biology arising and rapidly developing in the past decade is the problem of electromagnetic signalling in animate nature which uses a broad range of the spectrum from infralow to superhigh frequencies for information communications. Basic empirical data and theoretical arguments are reviewed indicating the existence of electromagnetic signalling in the range of the spectrum on all levels of organization of the animate world -- from molecular to the biosphere. Author

N74-30479*# Minnesota Univ., Minneapolis. Dept. of Microbiology.
FLUORESCENT ANTIBODY DETECTION OF MICROORGANISMS IN TERRESTRIAL ENVIRONMENTS Final Report, 1 Jul. 1970 - 31 Dec. 1972
Edwin L. Schmidt 31 Dec. 1972 5 p refs
(Grant NGR-24-005-198)
(NASA-CR-139386) Avail: NTIS HC $4.00 CSCL 06M

The fluorescent antibody technique and its use in direct microscopic examination of the soil is discussed. Feasibility analyses were made to determine if the method could be used to simultaneously observe and recognize microorganisms in the soil. Some data indicate this may be possible. Data are also given on two related problems involving the interaction of soil microorganisms with plant roots to form symbiotic structures. One was concerned with the developmental ecology and biology of the root nodule of alder and the second was concerned with the ectotrophic mycorrhizal structure on forest trees, especially pines. In both, the fluorescent antibody detection of the microbial symbiont both as a free living form in soil, and as a root inhabiting form in the higher plant was emphasized. A third aspect of the research involved the detection of autotrophic ammonia oxidizing microorganisms in soil. Author

N74-30480*# Food and Drug Administration, Cincinnati, Ohio. Food Research Lab.
ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS Quarterly Progress Report, 1 Jan. - 31 Mar. 1974
J. E. Campbell Jun. 1974 22 p
(NASA Order W-13411)
(NASA-CR-139485; QPR-36) Avail: NTIS HC $4.25 CSCL 06M

The uses of scanning electron microscopy in assessing changes that occur in spores exposed to wet and dry heat cycles at elevated temperatures were examined. Several species of Bacillus and other nonspore-forming species of organisms were used for the experiment. Surface morphology of viable and nonviable organisms was clearly detectable by this method, making it a potentially useful technique for investigating microbial inactivation on space vehicle surfaces and components. Micrographs of the spores and bacterial cells are provided. A.A.D.

N74-30481*# Utah State Univ., Logan.
PLANT ADAPTATION TO COLD. 1: CHLOROPHYLL 2: MINERALS M.S. Thesis
Peter Rosen 1972 80 p refs
(Grant NGR-45-002-008)
(NASA-CR-139528) Avail: NTIS HC $7.00 CSCL 06C

A number of montane herbs in northern Utah typically form flower buds beneath the snow cover and flower either through it or immediately after its recession. Two of these species, one naturally occurring, Claytonia lanceolata, and one cultivated bulb, Galanthus nivalis, were investigated for their response to this stress environment. Snow depth patterns, chlorophyll content of tissues, and plants grown in light-tight boxes, suggest that light passing through the snow to reach plants growing underneath is not critically involved in the timing of their developmental cycles or in their ability to endure this low temperature environment. Ability to endure stress seems to be closely related in a number of ways to activity at the plant membranes. Plants were protected from low temperature damage by application of cytokinin or calcium, both of which probably acted at the membrane. Potassium calcium antagonisms were reflected in the internal distribution of the ions under natural stress conditions; and plants that differentiated at the meristem while growing through the snow accumulated calcium at the tip during this growth. Author

N74-30482# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany).
THE CATECHOLAMINE AND 17-HYDROXYCORTICOIDEXCRETION OF FIVE AQUA-

NAUTS DURING THEIR STAY IN THE UNDERWATERLABORATORY TEKTITE 2
H. Oser and H.-M. Wegmann 1974 27 p refs In GERMAN; ENGLISH summary
(DLR-FB-74-02) Avail: NTIS HC $4.50; DFVLR, Porz, West Ger. 11,40 DM

Studies were performed on five aquanauts of the U.S. underwaterlaboratory Tektite 2 during their 14-day-stay in a high pressure environment by analyzing the urinary excretion of catecholamines and 17-hydroxycorticosteriods (17-OHCS). The results showed a distinct increase of both the catecholamines and the 17-OHCS. Though the rythm of life was shifted the excretion of noradrenaline and 17-OHCS showed a stable circadian pattern whereas adrenaline was shifted by about 8 hours towards the night. The increased excretion rates indicate a stress situation which was caused by many dives and the life in an underwater habitat. ESRO

N74-30483# Pennsylvania State Univ., University Park. Center for Air Environment Studies.
INFLUENCE OF ALTERED GASEOUS ENVIRONMENTS ON LUNG METABOLISM Interim Progress Report, 1 Jun. 1973 - 31 May 1974
Rodney A. Rhoades Mar. 1974 25 p refs
(Grant AF-AFOSR-2559-73; AF Proj. 9777)
(AD-779048; CAES-1; AFOSR-74-0752TR; IPR-1) Avail: NTIS CSCL 06/19

To date, the main findings of this investigation indicate the acute hypoxic stress (1.5 hr. to PO2 34mmHg) does not markedly accelerate glucose uptake, decrease lipid synthesis, deplete tissue glycogen, or shut down citric acid cycle activity with a concomitant decrease in glucose and fatty acid oxidation; effects commonly seen in other organs. Thus, the lung appears to be more resistant to hypoxic stress. Finally, exposure to hyperoxia for 1.5 hr. has little detrimental effect on the metabolic process of the lung.
Author (GRA)

N74-30484# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
CHARACTERISTICS OF THE AVERAGE HUMAN VISUAL EVOKED RESPONSE (VER) M.S. Thesis
David J. Irwin Mar. 1974 115 p refs
(AF Proj. 7184)
(AD-779079; GE/BE/74-7) Avail: NTIS CSCL 05/10

Apparatus and procedure were designed to present subjects with point-source visual stimuli in the 50-75% threshold range and to record their psychophysical and physiological responses. A total of six subjects were tested using a forced choice testing procedure. The data obtained from the experiment consisted of over 3600 single-trial EEG records one-half second in length. A group analysis of the data was accomplished, and a computer program was developed to identify whether or not the stimulus was perceived in each EEG record. The computer analysis is based on a filtered Fourier transform identification technique developed by the Air Force Institute of Technology and the Aerospace Medical Research Laboratory. The results of the computer analysis were compared with the subject's psychophysical responses to calculate the probability of detection. (Modified author abstract) GRA

N74-30485# State Univ. of New York, Brockport. Dept. of Biology.
THE DEGRADATION OF OIL IN CONTINUOUS CULTURE Annual Report, 1 Sep. 1972 - 31 Aug. 1973
P. H. Pritchard and T. J. Starr 19 Apr. 1974 82 p refs
(Contract N00014-73-C-0074; NR Proj. 133-070)
(AD-780234; AR-1) Avail: NTIS CSCL 06/13

A continuous culture system has been developed and tested for its usefulness in studying the degradation of oil and hydrocarbons. Both octane and diesel oil have been degraded in this system at measurable rates. Changes in these substrates and in the bacteria attacking them could be readily monitored and characterized. Oil and hydrocarbons could be degraded without mechanical dispersion and continuous culture enrichments were readily obtained as part of the degradation process. Sequential continuous culture systems have also been developed and tested successfully. An artificial oil has been developed to aid in the study of the bacterial mechanisms for degrading oil. A successful fish embryo bioassay has been developed and it has been shown that water extracts of oil and toluene interfere with embryological development. Oil degradation products also interfere with development but in a different manner.
Author (GRA)

N74-30486# Naval Submarine Medical Research Lab., Groton, Conn.
EFFECTS OF REPETITION AND DARK ADAPTATION ON VISUAL EVOKED RESPONSES IN THE RAT Interim Report
Raymond T. Bartus and Steven H. Ferris 1 Feb. 1974 14 p (MR04101)
(AD-780060; NSMRL-770) Avail: NTIS CSCL 06/16

Rats chronically implanted with monopolar electrodes in the primary visual cortex were used to evaluate progressive changes occurring in the amplitude of visual evoked responses to repeated visual stimuli. It was found that if the rats were dark-adapted prior to testing, no consistent changes occurred in the early components of the evoked response. Without sufficient dark adaptation however, progressive increases in these components were observed. Contrary to these changes, the later evoked response components exhibited reliable changes over trial blocks regardless of whether prior dark adaptation was given. It was concluded that these later-component changes are best explained as correlates of central nervous system habituation. These data may be taken into account in hyperbaric experiments in which the averaged evoked response is used as a measure of neural functioning, thus often alleviating the need for certain costly control conditions; they may provide an additional tool for research programs interested in assessing the effects of hyperbaric environments on simple neurobehavioral processes.
Author (GRA)

N74-30487 British Library Lending Div., Boston Spa (England).
VISUAL RANGE OF AN OBJECT IN THE ATMOSPHERE
M. Gazzi and V. Vicentini 4 Feb. 1974 40 p refs Transl. into ENGLISH from the Italian
(BLL-DRIC-Trans-3318-(3623.66)) Avail: British Library Lending Div., Boston Spa, Engl.: 4 BLL photocopy coupons

Briefly demonstrated are the elementary principles which form the basis of vision in the atmosphere. Visual range, elementary theory of vision, attenuation and light of the atmosphere, contrasts threshold, and calculation of visual range are all considered.
Author

N74-30488*# Kanner (Leo) Associates, Redwood City, Calif.
MAN-OPERATOR IN SPACE
Ye. Khrunov, L. Khachaturyants, V. Popov, and Ye. Ivanov Washington NASA Aug. 1974 403 p refs Transl. into ENGLISH of the book "Chelovek-operator v Kosmicheskom Polete" Moscow, Mashinostr. Press, 1974 399 p
(Contract NASw-2481)
(NASA-TT-F-15714) Avail: NTIS HC $23.25 CSCL 05E

The psychological and physiological factors affecting manned space flight were studied. The various psychological factors (tension, fatigue, motivation) and physiological factors (exhaustion, vision, hearing, tactile sensation) are examined as they relate to man's performance in decision-making, perception of information, and problem-solving. The conclusion is reached that man forms a vital link in the control system of spacecraft and, in certain respects, performs inherently better than purely automated systems. THe various applications of manned space flight are also discussed including agriculture, meteorology, forestry, and mining.
Author

N74-30489*# Northrop Corp., Hawthorne, Calif. Research and Technology Center.
RESEARCH ON THE PROPERTIES OF CIRCADIAN SYSTEMS AMENABLE TO STUDY IN SPACE Final Report
R. G. Lindberg and P. Hayden Jun. 1974 185 p refs
(Contract NAS2-5037)
(NASA-CR-137523) Avail: NTIS HC $12.25 CSCL 05E

Three areas of inquiry are reported for the Skylab Experiment S-071 whose objective was to study the circadian system of a mammal during space flight. The thermoregulatory behavior of the Perognathus longimembris, or little pocket mouse, was studied under conditions of constant dark and constant temperature in the prolonged weightless environment of Skylab. The following specific questions were studied: (1) the effects of weightlessness on circadian periodicity in the little pocket mouse; (2) stability of the free-running circadian period of body temperature of the little pocket mouse exposed to simulated launch stress; and (3) characteristics of the circadian rhythm of body temperature in the little pocket mouse. Diagrams of the electronic circuitry and hardware used in the experiment are shown and results are given in both graphical and tabular form. The methods used in the experiment are fully documented, along with conclusions and recommendations for future research. A.A.D.

N74-30490*# Technology, Inc., Houston, Tex. Life Sciences Div.
SKYLAB FOOD SYSTEM LABORATORY SUPPORT Final Report, 1 May 1972 - 30 Jun. 1974
Dennis Sanford 30 Jun. 1974 65 p
(Contract NAS9-12926)
(NASA-CR-134380) Avail: NTIS HC $6.25 CSCL 06H

A summary of support activities performed to ensure the quality and reliability of the Skylab food system design is reported. The qualification test program was conducted to verify crew compartment compatibility, and to certify compliance of the food system with nutrition, preparation, and container requirements. Preflight storage requirements and handling procedures were also determined. Information on Skylab food items was compiled including matters pertaining to serving size, preparation information, and mineral, calorie, and protein content. Accessory hardware and the engraving of food utensils were also considered, and a stowage and orientation list was constructed which takes into account menu use sequences, menu items, and hardware stowage restrictions. A food inventory system was established and food thermal storage tests were conducted. Problems and comments pertaining to specific food items carried onboard the Skylab Workshop were compiled. A.A.D.

N74-30491*# Orion Research, Inc., Cambridge, Mass.
AUTOMATED POTENTIOMETRIC ELECTROLYTE ANALYSIS SYSTEM Final Report
14 Dec. 1973 185 p
(Contract NAS9-12117)
(NASA-CR-134373; MSC-14627) Avail: NTIS HC $12.25 CSCL 06B

The feasibility is demonstrated of utilizing chemical sensing electrode technology as the basis for an automatically-controlled system for blood gas and electrolyte analyses under weightlessness conditions. The specific measurements required were pH, pCO2, sodium, chloride, potassium ions, and ionized calcium. The general electrode theory, and ion activity measurements are described along with the fluid transport package, electronics unit, and controller for the automated potentiometric analysis system.
Author

N74-30492*# Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2, APPENDIX A: ACTIVE HEATING SYSTEM-SCREENING ANALYSIS. APPENDIX B: RECONSTITUTED FOOD HEATING TECHNIQUES ANALYSIS Final Report
[1974] 170 p
(Contract NAS9-13138)
(NASA-CR-134375) Avail: NTIS HC $11.50 CSCL 06H

Technical data are presented which were used to evaluate active heating methods to be incorporated into the space shuttle food system design, and also to evaluate the relative merits and penalties associated with various approaches to the heating of rehydrated food during space flight. Equipment heating candidates were subject to a preliminary screening performed by a selection rationale process which considered the following parameters: (1) gravitational effect; (2) safety; (3) operability; (4) system compatibility; (5) serviceability; (6) crew acceptability; (7) crew time; (8) development risk; and (9) operating cost. A hot air oven, electrically heated food tray, and microwave oven were selected for further consideration and analysis. Passive, semi-active, and active food preparation approaches were also studied in an effort to determine the optimum method for heating rehydrated food. Potential complexity, cost, vehicle impact penalties, and palatability were considered in the analysis. A summary of the study results is provided along with cost estimates for each of the potential sytems A.A.D.

N74-30493*# Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM. VOLUME 2, APPENDIX C: FOOD COOLING TECHNIQUES ANALYSIS. APPENDIX D: PACKAGE AND STOWAGE: ALTERNATE CONCEPTS ANALYSIS
[1974] 151 p
(Contract NAS9-13138)
(NASA-CR-134376) Avail: NTIS HC $10.75 CSCL 06H

The relative penalties associated with various techniques for providing an onboard cold environment for storage of perishable food items, and for the development of packaging and vehicle stowage parameters were investigated in terms of the overall food system design analysis of space shuttle. The degrees of capability for maintaining both a 40 F to 45 F refrigerated temperature and a 0 F and 20 F frozen environment were assessed for the following cooling techniques: (1) phase change (heat sink) concept; (2) thermoelectric concept; (3) vapor cycle concept; and (4) expendable ammonia concept. The parameters considered in the analysis were weight, volume, and spacecraft power restrictions. Data were also produced for packaging and vehicle stowage parameters which are compatible with vehicle weight and volume specifications. Certain assumptions were made for food packaging sizes based on previously generated space shuttle menus. The results of the study are shown, along with the range of meal choices considered. A.A.D.

N74-30494*# Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2, APPENDIX F: FLIGHT FOOD AND PRIMARY PACKAGING Final Report
[1974] 252 p
(Contract NAS9-13138)
(NASA-CR-134378) Avail: NTIS HC $15.75 CSCL 06H

The analysis and selection of food items and primary packaging, the development of menus, the nutritional analysis of diet, and the analyses of alternate food mixes and contingency foods is reported in terms of the overall food system design for space shuttle flight. Stowage weights and cubic volumes associated with each alternate mix were also evaluated. Author

N74-30495*# Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2. APPENDIX G: GROUND SUPPORT SYSTEM ANALYSIS. APPENDIX H: GALLEY FUNCTIONAL DETAILS ANALYSIS
[1974] 60 p
(Contract NAS9-13138)
(NASA-CR-134379) Avail: NTIS HC $6.00 CSCL 06H

The capabilities for preflight feeding of flight personnel and the supply and control of the space shuttle flight food system were investigated to determine ground support requirements; and the functional details of an onboard food system galley are shown in photographic mockups. The elements which were identified as necessary to the efficient accomplishment of ground support functions include the following: (1) administration; (2) dietetics; (3) analytical laboratories; (4) flight food warehouse; (5) stowage module assembly area; (6) launch site module storage area; (7) alert crew restaurant and disperse crew galleys; (8) ground food warehouse; (9) manufacturing facilities; (10) transport; and (11) computer support. Each element is discussed according to the design criteria of minimum cost, maximum flexibility, reliability, and efficiency consistent with space shuttle requirements. The galley mockup overview illustrates the initial operation configuration, food stowage locations, meal assembly and serving trays, meal preparation configuration, serving, trash

management, and the logistics of handling and cleanup equipment. A.A.D.

N74-30496*# Structural Composites Industries, Inc., Azusa, Calif.
IMPROVED FIREMAN'S COMPRESSED AIR BREATHING SYSTEM PRESSURE VESSEL DEVELOPMENT PROGRAM
Harry A. King and Edgar E. Morris Aug. 1973 419 p
(Contract NAS9-12414)
(NASA-CR-134385; SCI-7338) Avail: NTIS HC $24.00 CSCL 06K

Prototype high pressure glass filament-wound, aluminum-lined pressurant vessels suitable for use in a fireman's compressed air breathing system were designed, fabricated, and acceptance tested in order to demonstrate the feasibility of producing such high performance, lightweight units. The 4000 psi tanks have a 60 Standard Cubic Foot (SCF) air capacity, and have a 6.5 inch diamter, 19 inch length, 415 inch volume, weigh 13 pounds when empty, and contain 33 percent more air than the current 45 SCF (2250 psi) steel units. The current steel 60 SCF (3000 psi) tanks weigh approximately twice as much as the prototype when empty, and are 2 inches, or 10 percent shorter The prototype units also have non-rusting aluminum interiors, which removes the hazard of corrosion, the need for internal coatings, and the possibility of rust particles clogging the breathing system. AAuthor

N74-30497*# Martin Marietta Corp., Denver, Colo.
FIREFIGHTER'S COMPRESSED AIR BREATHING SYSTEM PRESSURE VESSEL DEVELOPMENT PROGRAM Final Report
E. J. Beck Aug. 1974 211 p refs
(Contract NAS9-12540)
(NASA-CR-134384; MCR-73-214) Avail: NTIS HC $13.75 CSCL 06K

The research to design, fabricate, test, and deliver a pressure vessel for the main component in an improved high-performance firefighter's breathing system is reported. The principal physical and performance characteristics of the vessel which were required are: (1) maximum weight of 9.0 lb; (2) maximum operating pressure of 4500 psig (charge pressure of 4000 psig); (3) minimum contained volume of 280 in. 3; (4) proof pressure of 6750 psig; (5) minimum burst pressure of 9000 psig following operational and service life; and (6) a minimum service life of 15 years. The vessel developed to fulfill the requirements described was completely sucessful, i.e., every category of performence was satisfied. The average weight of the vessel was found to be about 8.3 lb, well below the 9.0 lb specification requirement. Author

N74-30498*# Life Systems, Inc., Cleveland, Ohio.
SIX-MAN, SELF-CONTAINED CARBON DIOXIDE CONCENTRATOR SUBSYSTEM FOR SPACE STATION PROTOTYPE (SSP) APPLICATION Final Report
G. D. Kostell, F. H. Schubert, J. W. Shumar, T. M. Hallick, and F. C. Jensen May 1974 77 p refs
(Contract NAS2-6478)
(NASA-CR-114742; LSI-ER-170-34) Avail: NTIS HC $7.00 CSCL 06K

A six man, self contained, electrochemical carbon dioxide concentrating subsystem for space station prototype use was successfully designed, fabricated, and tested. A test program was successfully completed which covered shakedown testing, design verification testing, and acceptance testing. Author

N74-30499*# Houston Univ., Tex. Dept. of Mechanical Engineering.
CHARACTERIZATION OF HEAT TRANSFER IN NUTRIENT MATERIALS, PART 1 Final Report
J. E. Cox, R. B. Bannerot, C. K. Chen, and L. C. Witte 31 Mar. 1973 47 p refs
(Contract NAS9-11676)
(NASA-CR-134382) Avail: NTIS HC $5.50 CSCL 06H

The principles involved in food heating are discussed. The food heating system for Skylab is described. Thermal models of nutrient materials are analyzed including models in zero-g and low pressure conditions. Results are presented of parametric studies to establish the effect of individual parameters on the thermal response of the system. E.J.O.

N74-30500*# Houston Univ., Tex. Dept. of Mechanical Engineering.
CHARACTERIZATION OF HEAT TRANSFER IN NUTRIENT MATERIALS, PART 2 Final Report
J. E. Cox, R. B. Bannerot, C. K. Chen, and L. C. Witte 31 Dec. 1973 43 p refs
(Contract NAS9-11676)
(NASA-CR-134383; Rept-9-11676-32-Pt-2) Avail: NTIS HC $5.25 CSCL 06H

A thermal model is analyzed that takes into account phase changes in the nutrient material. The behavior of fluids in low gravity environments is discussed along with low gravity heat transfer. Thermal contact resistance in the Skylab food heater is analyzed. The original model is modified to include: equivalent conductance due to radiation, radial equivalent conductance, wall equivalent conductance, and equivalent heat capacity. A constant wall-temperature model is presented. E.J.O.

N74-30501# Naval Aerospace Medical Inst., Pensacola, Fla.
MICROWAVE REFLECTION, DIFFRACTION AND TRANSMISSION STUDIES OF MAN Medical Research Projects Report No. 2
Vernon R. Reno 7 Feb. 1974 46 p refs
(AD-780226; NAMRL-1199) Avail: NTIS CSCL 06/18

A systematic, detailed description of the spatial energy distribution in microwave fields in proximity to man is provided for the first time. Graphic information is provided to demonstrate the effects on the energy distribution of different radiation parameters such as frequency and polarization and of the ratio of subject size to wavelength. The field patterns obtained with man are compared to theoretical studies of simpler objects available in the literature. The information obtained in the present studies is immediately applicable to hazard evaluations and to the design of bioeffect investigations. The most significant benefit of the approach is in the potential for development of a new, noninvasive method for estimating the energy absorbed by man or animals from an incident microwave field. (Modified author abstract) GRA

N74-30722* Centre for Overseas Pest Research, London (England).
ERTS SURVEYS A 500 km SQUARED LOCUST BREEDING SITE IN SAUDI ARABIA
D. E. Pedgley *In* NASA. Goddard Space Flight Center 3d ERTS-1 Symp., Vol. 1, Sect. A 1974 p 233-246

(Paper-A15) CSCL 06C

From September 1972 to January 1973, ERTS-1 precisely located a 500 sq km area on the Red Sea coastal plain of Saudi Arabia within which the Desert Locust (Schistocerca gregaria, Forsk.) bred successfully and produced many small swarms. Growth of vegetation shown by satellite imagery was confirmed from ground surveys and raingauge data. The experiment demonstrates the feasibility of detecting potential locust breeding sites by satellite, and shows that an operational satellite would be a powerful tool for routine survey of the 3 x 10 to the 7th power sq km invasion area of the Desert Locust in Africa and Asia, as well as of other locust species in the arid and semi-arid tropics. Author

N74-30813* Philco-Ford Corp., Philadelphia, Pa.
AN EVALUATION OF THE USE OF ERTS-1 SATELLITE IMAGERY FOR GRIZZLY BEAR HABITAT ANALYSIS
Joel R. Varney, John J. Craighead (Mont. Univ., Missoula), and Jay S. Sumner (Mont. Univ., Missoula) *In* NASA. Goddard Space Flight Center 3d ERTS-1 Symp., Vol. 1, Sect. B 1974 p 1653-1670 refs
(Grant NGR-27-002-006)
(Paper-E11) CSCL 06C

Improved classification and mapping of grizzly habitat will permit better estimates of population density and distribution,

and allow accurate evaluation of the potential effects of changes in land use, hunting regulation, and management policies on existing populations. Methods of identifying favorable habitat from ERTS-1 multispectral scanner imagery were investigated and described. This technique could reduce the time and effort required to classify large wilderness areas in the Western United States.
Author

N74-30814* Environmental Research Inst. of Michigan, Ann Arbor.
UTILITY OF ERTS FOR MONITORING THE BREEDING HABITAT OF MIGRATORY WATERFOWL
Edgar A. Work, Jr., David S. Gilmer (Northern Prairie Wildlife Res. Center), and A. T. Klett (Northern Prairie Wildlife Res. Center) *In* NASA. Goddard Space Flight Center 3d ERTS-1 Symp., Vol. 1, Sect. B 1974 p 1671-1686 refs

(Paper-E12) CSCL 06C

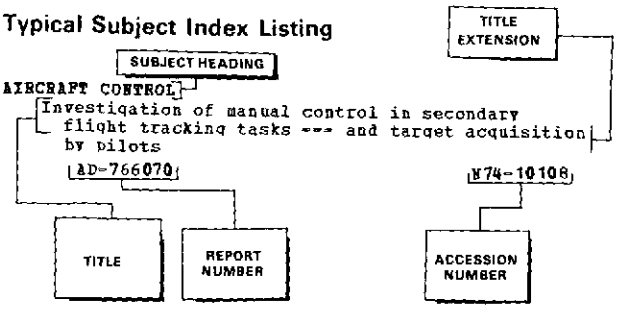
Since 1968 the Bureau of Sport Fisheries and Wildlife (BSF&W) and the Environmental Research Institute of Michigan have cooperated on developing applications of remote sensing to the management of migratory waterfowl. Basically, this work has been concerned with (1) the assimilation of data on surface water conditions so that the data can be used as an index of annual waterfowl production, and (2) the collection of data on land use and wetland quality so that a measure of habitat carrying capacity is obtained. To date, efforts have been directed toward utilizing ERTS to monitor surface water conditions. An example of a model used for predicting the annual production of mallards (Anas platyrhynchos) is presented. The data inputs to this model and the potential for acquiring these data using ERTS are described.
Author

N74-30846 Joint Publications Research Service, Arlington, Va.
SCIENTIFIC PROJECTS AT PUSHCHINO BIOLOGICAL STUDY CENTER
L. Repetskiy *In its* The Earth's Future and Res. at Pushchino City (JPRS-62356) 1 Jul. 1974 p 13-21 Transl. into ENGLISH from Nauka Zhizn (USSR), no. 4, 1974 p 106-111

The Pushchino Biological Study Center is described. Research in the areas of microbiology, biophysics, and agrochemistry is reported.
E.J.O.

Subject Index

Typical Subject Index Listing



The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, a title extension is added, separated from the title by three hyphens. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

A

ACCELERATION (PHYSICS)
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290

ACCELERATION STRESSES (PHYSIOLOGY)
Stability of the intracranial circulation in an altered gravitational field
A74-39796
Cardiac injuries resulting from ejection
A74-40282
Predicting resistance to G-forces by the aid of a decompression functional test
[NASA-TT-F-15823] N74-30471

ACCIDENT PRONENESS
The deadly triad --- aircraft accident factors
A74-40278

ACOUSTIC EXCITATION
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472

ACOUSTO-OPTICS
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

ACTIVATION ENERGY
The energy aspect of the mechanism of enzyme action
[NASA-TT-F-15835] N74-30465

ACTIVITY (BIOLOGY)
Measurement of the motor activity of test animals
A74-38285
Adaptation as a factor modifying the stability of enzymes
[NASA-TT-F-15505] N74-30474

ADAPTATION
Ecological physiology of animals --- physiological adaptation to environment and micro-evolution of functions
[NASA-TT-F-14203] N74-30464
Plant adaptation to cold. 1: Chlorophyll. 2: Minerals
[NASA-CR-139528] N74-30481

ADENOSINES
Challenges to the adenosine hypothesis for the regulation of coronary blood flow
A74-38233
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides
A74-40682

ADRENAL GLAND
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900

ADRENAL METABOLISM
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen
A74-38915

ADRENERGICS
Evaluation of isoproterenol as a method of stress testing
A74-38121

AERIAL RECONNAISSANCE
Summary of the Human Engineering Laboratory's air-to-ground target detection studies using stationary targets
[AD-779409] N74-29469

AEROBIOLOGY
Outline of experimental aeromicrobiology --- Russian book
A74-38048

AERODYNAMIC NOISE
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140

AEROSOLS
Outline of experimental aeromicrobiology --- Russian book
A74-38048

AEROSPACE MEDICINE
New concepts of medical facilities aboard large-capacity aircraft
A74-38506
The doctor-pilot relationship
A74-38508
The Manned Spacecraft Center and medical technology
A74-38703
Recovery of medically important microorganisms from Apollo astronauts
A74-39792
Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings
A74-40276
USAF School of Aerospace Medicine survival training
A74-40621
How space medicine helps terrestrial
[BLL-M-23364-(5828.4F)] N74-30456
Biologist's questions to space
[BLL-M-23267-(5828.4F)] N74-30459

AEROSPACE SYSTEMS
Telemanipulators - A facility for conquering space by man
A74-40117

AFTERIMAGES
On interocular transfer of various visual aftereffects in normal and stereoblind observers
A74-38089

AGE FACTOR
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120

AGRICULTURE
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445

AIR FLOW
Fluid flow in a model alveolar sac
A74-40760

AIR POLLUTION
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893
Health consequences of sulfur oxides: A report from CHESS, 1970-1971
[EPA-650/1-74-004] N74-29444

AIR PURIFICATION
Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application
[ASME PAPER 74-ENAS-16] A74-39120
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498

AIR TRAFFIC CONTROL
The determination of stress and fatigue, taking into account the example of air traffic controllers
A74-40334
Physiological responses in air traffic control personnel: Houston Intercontinental Tower --- adapation to stress
[AD-777838] N74-29465

AIRBORNE/SPACEBORNE COMPUTERS
Control algorithm of the walker climbing over obstacles
A74-39521

AIRCRAFT ACCIDENT INVESTIGATION
Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings
A74-40276
Aviation pathology and the group system - A case of breakup in the air
A74-40277
The deadly triad --- aircraft accident factors
A74-40278
Myocarditis and the aircraft accident
A74-40283
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286

AIRCRAFT ACCIDENTS
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
USAF School of Aerospace Medicine survival training
A74-40621

AIRCRAFT DESIGN
The deadly triad --- aircraft accident factors
A74-40278

AIRCRAFT NOISE
Effects of aircraft noise on man
A74-40091

AIRCRAFT PILOTS
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/
A74-38507

AIRLINE OPERATIONS
Ride quality evaluation 1: Questionnaire studies of airline passenger comfort
[NASA-CR-139368] N74-29460

AIRLOCK MODULES
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137

AIRPORTS
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800

ALERTNESS
Correlation of hippocampal theta rhythm with changes in cutaneous temperature --- evoked neuron response in thermoregulation
[NASA-CR-139527] N74-30461

ALGORITHMS
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465
Control algorithm of the walker climbing over obstacles
A74-39521

ALTITUDE ACCLIMATIZATION
Effect of prolonged stay at altitude /4000 m/ on autonomic balance
A74-39797
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765

ALTITUDE TOLERANCE
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat
A74-39791
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/
A74-39795
Effect of prolonged stay at altitude /4000 m/ on autonomic balance
A74-39797
Glucose tolerance tests in rats exposed to varying altitude stress
A74-39799

ALVEOLAR AIR
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753
Fluid flow in a model alveolar sac
A74-40760
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model
A74-40766

AMBIENT TEMPERATURE
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904

AMINES
HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft
[ASME PAPER 74-ENAS-57] A74-39149

AMPLITUDE DISTRIBUTION ANALYSIS
Comments on estimations and tests of EEG amplitude distributions
A74-40449

ANESTHESIA
Effect of anesthesia on rate of N2 washout from body stores
A74-40757

ANGIOGRAPHY
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
Evaluation of isoproterenol as a method of stress testing
A74-38121
Angiocardiographic methods for determination of left ventricular geometry and volume
A74-39632
Clinical applications of angiocardiography
A74-39633

ANIMALS
Electromagnetic signaling in animate nature
[JPRS-62434] N74-30478
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana
[PAPER-B11] N74-30813

ANNUAL VARIATIONS
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
Periodic (seasonal and yearly) changes in the organism of rats: Their causes and effects
[NASA-TT-F-14101] N74-30463

ANTARCTIC REGIONS
Use of remote sensing in the study of Antarctic marine resources
A74-39278
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
ANTIBODIES
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438
Study of antinuclear antibodies in subjects with photodermatitis --- antibody response to nucleic acids irradiated with ultraviolet radiation
[NASA-TT-F-15844] N74-30466
Fluorescent antibody detection of microorganisms in terrestrial environments
[NASA-CR-139386] N74-30479
ANTIGENS
Plasma cell surface antigen on human blood lymphocytes
A74-39380
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438
AORTA
Topography of aortic heart valves --- applied to the development of a prosthetic heart valve
[NASA-CR-139566] N74-30476
APOLLO FLIGHTS
Apollo space crew cardiovascular evaluations
A74-39790
APOLLO PROJECT
Recovery of medically important microorganisms from Apollo astronauts
A74-39792
APTITUDE
Feasibility of using special measures in the classification and assignment of lower mental ability airmen
[AD-777831] N74-29467
ARRHYTHMIA
Conduction defects in experimental atrial arrhythmia
A74-38124
ARTERIES
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
Coronary artery occlusion and blood lipids
A74-38122
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
ASIA
Periodic (seasonal and yearly) changes in the organism of rats: Their causes and effects
[NASA-TT-F-14101] N74-30463
ATMOSPHERIC PRESSURE
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468
ATMOSPHERIC TURBULENCE
On the question of pilot deterioration during low altitude flight --- response to turbulence
[NASA-TT-F-15799] N74-30470
ATTENTION
Can attention be allocated to sensory modalities --- simultaneous visual, auditory and tactile information processing
A74-40129
ATTITUDE INDICATORS
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510
AUDITORY DEFECTS
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation
A74-38857
Upper limit to stapes displacement - Implications for hearing loss
A74-38859
AUDITORY PERCEPTION
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472
The effect of masker duration on forward and backward masking
A74-40126
Can attention be allocated to sensory modalities --- simultaneous visual, auditory and tactile information processing
A74-40129
Latency of sound localization as a function of azimuth and frequency
A74-40168
AUDITORY SENSATION AREAS
Coronal topography of human auditory evoked responses
A74-40447
AUDITORY STIMULI
Reaction of central auditory neurons to signals with different directions of frequency modulation
A74-38343
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation
A74-38857
Transformation function of the external ear in response to impulsive stimulation
A74-38858
AUTOMATIC CONTROL
Control of a multi-legged vehicle
A74-39509
Automated potentiometric electrolyte analysis system --- for use in weightlessness
[NASA-CR-134373] N74-30491
AUTOMOBILE ACCIDENTS
A user-oriented program for crash dynamics --- human response simulation for automobile accidents
A74-39782
AUTONOMIC NERVOUS SYSTEM
Effect of prolonged stay at altitude /4000 m/ on autonomic balance
A74-39797
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
AUTOPSIES
Deaths from burns in Army aircraft, 1965-1971
A74-40280
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286
AVIONICS
Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design
A74-38527
AXONS
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344
AZIMUTH
Latency of sound localization as a function of azimuth and frequency
A74-40168

B

BACTERIA
Outline of experimental aeromicrobiology --- Russian book
A74-38048
The degradation of oil in continuous culture
[AD-780234] N74-30485
BACTERICIDES
Silver ion bactericide system --- for Space Shuttle Orbiter potable water
[ASME PAPER 74-ENAS-49] A74-39142

An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147

BAILOUT
Cardiac injuries resulting from ejection A74-40282

BATHING
Design, fabrication and acceptance testing of a zero gravity whole body shower
[ASME PAPER 74-ENAS-51] A74-39144

BINOCULAR VISION
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change A74-38086
On interocular transfer of various visual aftereffects in normal and stereoblind observers A74-38089
Binocular brightness combinations - Additive and nonadditive aspects A74-40133

BIOACOUSTICS
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation A74-38857
Transformation function of the external ear in response to impulsive stimulation A74-38858
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections A74-39821

BIOASSAY
Estimation of phasic intra-ventricular volume by electromagnetic induction A74-39208
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration A74-40279

BIOASTRONAUTICS
The Manned Spacecraft Center and medical technology A74-38703
Biologist's questions to space
[BLL-M-23267-(5828.4F)] N74-30459

BIOCHEMISTRY
Biochemical basis for cardiac contraction A74-39629
Modern views on oxygen toxicity A74-40442
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture A74-40684
Mechanical and biochemical correlates of cardiac hypertrophy A74-40685

BIOCONTROL SYSTEMS
Functional organization of the ocular motor system A74-39798
Frequency of feedback and learned heart rate control A74-40167
Control processes in biology and technology A74-40478

BIOELECTRIC POTENTIAL
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys A74-38600
Electrophysiological evidence for colour channels in human pattern vision A74-38646
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man A74-40448
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats A74-40450
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle A74-40903

BIOELECTRICITY
Relationship of the functional refractory period to conduction in the atrioventricular node A74-40679

BIOINSTRUMENTATION
Measurement of the motor activity of test animals A74-38285
The Manned Spacecraft Center and medical technology A74-38703
Characteristic biological sensors A74-39414
A contact stimulator for the study of cutaneous thermal sensibility A74-40767
Fabrication of neurophysiological monitoring systems
[NASA-CR-2416] N74-29461
Microelectronic bioinstrumentation system
[NASA-CR-139216] N74-29463

BIOLOGICAL EFFECTS
Life in weightlessness biological laboratories in orbit --- using Cosmos 605
[NASA-TT-F-15851] N74-29447
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462
Electromagnetic signaling in animate nature
[JPRS-62434] N74-30478
Research on the properties of circadian systems amenable to study in space --- using pocket mice in Skylab experiment S-071 for the study of the effects of prolonged weightlessness
[NASA-CR-137523] N74-30489

BIOLOGICAL EVOLUTION
Ecological physiology of animals --- physiological adaptation to environment and micro-evolution of functions
[NASA-TT-F-14203] N74-30464

BIOLOGY
A collection of translations of foreign language papers on the subject of biological sonar systems
[AD-778691] N74-29454
Scientific projects at Pushchino Biological Study Center --- biological research N74-30846

BIOMEDICAL DATA
Computer analysis of ultrasoundcardiograms A74-38289

BIOMETRICS
Conduction defects in experimental atrial arrhythmia A74-38124
Measurement of the motor activity of test animals A74-38285
The Manned Spacecraft Center and medical technology A74-38703
Estimation of phasic intra-ventricular volume by electromagnetic induction A74-39208
Characteristic biological sensors A74-39414

BIONICS
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine A74-38290
A model of heat transfer in immersed man A74-38911
Force-velocity studies in isolated and intact heart muscle A74-39630
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function A74-39636
A conceptual model of myocardial infarction and cardiogenic shock A74-39638
Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle A74-39640
Rheological modeling of the intact left ventricle A74-39641
Judgments about the duration of brief stimuli --- in visual discrimination A74-40127
Binocular brightness combinations - Additive and nonadditive aspects A74-40133
A model of cardiac muscle dynamics A74-40678
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model A74-40766

BIOTECHNOLOGY
Design, fabrication and acceptance testing of a zero gravity whole body shower
[ASME PAPER 74-ENAS-51] A74-39144
BIOTELEMETRY
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
BIRDS
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814
BLOOD
Automated potentiometric electrolyte analysis system --- for use in weightlessness
[NASA-CR-134373] N74-30491
BLOOD CIRCULATION
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686
A description of model 3B of the multipurpose ventricular actuating system --- providing controlled driving pressures
[NASA-TM-X-71570] N74-29462
BLOOD FLOW
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232
Challenges to the adenosine hypothesis for the regulation of coronary blood flow
A74-38233
Role of O2 in control of the coronary capillary reserve
A74-38235
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog
A74-40464
BLOOD PLASMA
Coronary artery occlusion and blood lipids
A74-38122
Plasma cell surface antigen on human blood lymphocytes
A74-39380
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793
Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat
A74-40680
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759
Volume conditioned stimuli affecting salt and water excretion --- measurement of plasma volume and central venous pressure
[AD-779781] N74-29457
BLOOD PRESSURE
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
Control processes in biology and technology
A74-40478
Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat
A74-40680
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
Intrathoracic and venous pressure relationships during responses to changes in body position
A74-40755
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
Volume conditioned stimuli affecting salt and water excretion --- measurement of plasma volume and central venous pressure
[AD-779781] N74-29457
BLOOD VESSELS
Stability of the intracranial circulation in an altered gravitational field
A74-39796
BLOOD VOLUME
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208
Angiocardiographic methods for determination of left ventricular geometry and volume
A74-39632
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat
A74-39791
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463
Left ventricular volume as a determinant of myocardial oxygen consumption
A74-40465
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759
Limits of normal fluctuations of the basic hemodynamic indices in young men
A74-40799
Volume conditioned stimuli affecting salt and water excretion --- measurement of plasma volume and central venous pressure
[AD-779781] N74-29457
BODY KINEMATICS
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
BODY MEASUREMENT (BIOLOGY)
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog
A74-40464
BODY TEMPERATURE
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501
A model of heat transfer in immersed man
A74-38911
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462
BRAIN CIRCULATION
Stability of the intracranial circulation in an altered gravitational field
A74-39796
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides
A74-40682
BRAIN DAMAGE
Coronal topography of human auditory evoked responses
A74-40447
BREATHING
Sequence of regional filling during a tidal breath in man
A74-40754

Pressures developed by loaded inspiratory muscles in conscious and anesthetized man A74-40756

BREATHING APPARATUS
Improved fireman's compressed air breathing system pressure vessel development program [NASA-CR-134385] N74-30496
Firefighter's compressed air breathing system pressure vessel development program [NASA-CR-134384] N74-30497

BRIGHTNESS DISCRIMINATION
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity A74-38088
Binocular brightness combinations - Additive and nonadditive aspects A74-40133

BURNS (INJURIES)
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration A74-40279
Deaths from burns in Army aircraft, 1965-1971 A74-40280

C

CALIBRATING
Loudness discomfort level under earphone and in the free field - The effects of calibration methods A74-38856

CAPILLARY FLOW
Role of O2 in control of the coronary capillary reserve A74-38235

CARBOHYDRATE METABOLISM
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/ A74-39795
Glucose tolerance tests in rats exposed to varying altitude stress A74-39799

CARBON
Carbon wastewater treatment process [ASME PAPER 74-ENAS-46] A74-39141

CARBON DIOXIDE
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects A74-40753

CARBON DIOXIDE CONCENTRATION
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application [NASA-CR-114742] N74-30498

CARBON DIOXIDE REMOVAL
Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application [ASME PAPER 74-ENAS-16] A74-39120
Life support subsystem monitoring instrumentation [ASME PAPER 74-ENAS-25] A74-39128
Environmental control system development for manned spacecraft 1960-1973 [ASME PAPER 74-ENAS-50] A74-39143
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator [ASME PAPER 74-ENAS-53] A74-39146
Bosch CO2 reduction unit power studies [ASME PAPER 74-ENAS-55] A74-39148

CARDIAC AURICLES
Conduction defects in experimental atrial arrhythmia A74-38124

CARDIAC VENTRICLES
Factors determining the distribution and adequacy of left ventricular myocardial blood flow A74-38236
Estimation of phasic intra-ventricular volume by electromagnetic induction A74-39208
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia A74-39375
Cardiac mechanics; Physiological, clinical, and mathematical considerations --- Book A74-39626
Basic terminology and formulae for left ventricular wall stress A74-39627
Angiocardiographic methods for determination of left ventricular geometry and volume A74-39632
Clinical applications of angiocardiography A74-39633
Use of echocardiography to evaluate cardiac performance A74-39634
Systolic time intervals in the noninvasive assessment of left ventricular performance in man A74-39635
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle A74-39637
Review of various theories for the evaluation of left ventricular wall stresses A74-39639
Rheological modeling of the intact left ventricle A74-39641
Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations A74-39642
Left ventricular volume as a determinant of myocardial oxygen consumption A74-40465
Intraventricular conduction defects in acute myocardial infarction A74-40473
Alterations in left ventricular volumes induced by Valsalva manoeuvre A74-40474
Mechanical and biochemical correlates of cardiac hypertrophy A74-40685
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals A74-40762
Extent of myocardial flow from luminal collateral circulation A74-40763
A description of model 3B of the multipurpose ventricular actuating system --- providing controlled driving pressures [NASA-TM-X-71570] N74-29462

CARDIOGRAPHY
Angiocardiographic methods for determination of left ventricular geometry and volume A74-39632
Clinical applications of angiocardiography A74-39633
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections A74-39821

CARDIOVASCULAR SYSTEM
Oxygen transport during exercise in human subjects A74-38851
Apollo space crew cardiovascular evaluations A74-39790

CATABOLISM
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/ A74-39795

CATALYSIS
Space station prototype Sabatier reactor design verification testing [ASME PAPER 74-ENAS-58] A74-39150
The energy aspect of the mechanism of enzyme action [NASA-TT-F-15835] N74-30465

CATECHOLAMINE
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram A74-39793
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine A74-40440
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2 [DLR-FB-74-02] N74-30482

CELLS (BIOLOGY)
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345
Plasma cell surface antigen on human blood lymphocytes
A74-39380
Alterations in cellular and metabolic processes
[NASA-CR-139398] N74-30475
CENTRAL NERVOUS SYSTEM
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats
A74-40450
CEREBRAL CORTEX
Coronal topography of human auditory evoked responses
A74-40447
CHEMORECEPTORS
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375
CHEMOTHERAPY
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502
CHRONIC CONDITIONS
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
Observations of the embryonal rat pancreas during chronic hypoxia
A74-40439
CIRCADIAN RHYTHMS
Circadian variation in presumably heathly young soldiers
[NASA-CR-139234] N74-29452
Research on the properties of circadian systems amenable to study in space --- using pocket mice in Skylab experiment S-071 for the study of the effects of prolonged weightlessness
[NASA-CR-137523] N74-30489
CIVIL AVIATION
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/
A74-38507
CLIMATOLOGY
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445
CLINICAL MEDICINE
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502
Cardiac mechanics: Physiological, clinical, and mathematical considerations --- Book
A74-39626
Clinical applications of angiocardiography
A74-39633
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function
A74-39636
Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations
A74-39642
Comments on estimations and tests of EEG amplitude distributions
A74-40449
How space medicine helps terrestrial
[BLL-M-23364-(5828.4F)] N74-30456
Treatment of systemic lupus erythematosus with azathioprine
[NASA-TT-F-15840] N74-30473
CLOSED ECOLOGICAL SYSTEMS
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118
Space station prototype Sabatier reactor design verification testing
[ASME PAPER 74-ENAS-58] A74-39150
COASTAL PLAINS
ERTS surveys a 500 km squared locust breeding site in Saudi Arabia --- Red Sea coastal plain
[PAPER-A15] N74-30722
COCHLEA
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation
A74-38857
COLD TOLERANCE
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501
COLD WATER
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501
COLD WEATHER
Plant adaptation to cold. 1: Chlorophyll. 2: Minerals
[NASA-CR-139528] N74-30481
COLOR VISION
Spectral sensitivity of the modulation-sensitive mechanism of vision
A74-38084
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085
Electrophysiological evidence for colour channels in human pattern vision
A74-38646
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134
COMBUSTION PRODUCTS
Toxicology of polymeric materials exposed to heat and fires
A74-38894
COMFORT
Ride quality evaluation 1: Questionnaire studies of airline passenger comfort
[NASA-CR-139368] N74-29460
COMPLEX SYSTEMS
Control by generalized visual images
A74-39469
COMPRESSED AIR
Improved fireman's compressed air breathing system pressure vessel development program
[NASA-CR-134385] N74-30496
Firefighter's compressed air breathing system pressure vessel development program
[NASA-CR-134384] N74-30497
COMPUTER PROGRAMS
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290
A user-oriented program for crash dynamics --- human response simulation for automobile accidents
A74-39782
COMPUTER TECHNIQUES
Assessing the abundance and biomass of phytoplankton by means of electronic computers
[BLL-RTS-8914] N74-30454
COMPUTERIZED SIMULATION
A model of heat transfer in immersed man
A74-38911
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116
A user-oriented program for crash dynamics --- human response simulation for automobile accidents
A74-39782
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
COMPUTERS
The development of myopia in persons working with computer equipment
A74-40800
CONCENTRATORS
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator
[ASME PAPER 74-ENAS-53] A74-39146
CONDITIONING (LEARNING)
Frequency of feedback and learned heart rate control
A74-40167

Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486
CONDUCTION
Relationship of the functional refractory period to conduction in the atrioventricular node
A74-40679
CONDUCTIVE HEAT TRANSFER
A model of heat transfer in immersed man
A74-38911
CONFERENCES
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232
Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings
A74-40114
Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings
A74-40276
Symposium on Heat Stress and Heat Acclimatization
[AD-777700] N74-29449
CONJUNCTIVITIS
The development of myopia in persons working with computer equipment
A74-40800
CONSERVATION LAWS
Conservation of Shannon's redundancy for proteins --- information theory applied to amino acid sequences
A74-39244
CONTRACTION
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394
CONTROL EQUIPMENT
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
CONTROL SIMULATION
Control algorithm of the walker climbing over obstacles
A74-39521
CONTROL THEORY
Combined method for studying the quality, 'roughness', and stability of ergatic control systems
A74-40661
CONTROLLED ATMOSPHERES
Environmental control system development for manned spacecraft 1960-1973
[ASME PAPER 74-ENAS-50] A74-39143
COOLING SYSTEMS
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134
Space Shuttle heat pipe thermal control systems design and test
[ASME PAPER 74-ENAS-38] A74-39135
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis
[NASA-CR-134376] N74-30493
CORIOLIS EFFECT
The significance of cumulative coriolis acceleration for tests for expert medical selection --- using 376 men
[NASA-TT-F-15824] N74-29448
CORONARY CIRCULATION
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232
Challenges to the adenosine hypothesis for the regulation of coronary blood flow
A74-38233
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
Role of O2 in control of the coronary capillary reserve
A74-38235
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog
A74-40464
Intraventricular conduction defects in acute myocardial infarction
A74-40473
Extent of myocardial flow from luminal collateral circulation
A74-40763
CORTICOSTEROIDS
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen
A74-38915
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
CRASH INJURIES
A user-oriented program for crash dynamics --- human response simulation for automobile accidents
A74-39782
Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings
A74-40276
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
CRITICAL FLICKER FUSION
Spectral sensitivity of the modulation-sensitive mechanism of vision
A74-38084
CYBERNETICS
The multi-moded remote manipulator system
A74-39510
Control processes in biology and technology
A74-40478
CYTOCHROMES
Comments on papers by Reichert and Wong --- information theory for molecular taxonomy
A74-39247

D

DARK ADAPTATION
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134
Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486
DATA PROCESSING
Modes of control and the limits of control capability for human subjects
A74-40024
DECISION MAKING
Certain methodological approaches to studying pilot activity errors
A74-40798
Mathematical model of behavior developed on the basis of the theory of set
[AD-776128] N74-29450
DECISION THEORY
Judgments about the duration of brief stimuli --- in visual discrimination
A74-40127
DEGRADATION
The degradation of oil in continuous culture
[AD-780234] N74-30485
DEGREES OF FREEDOM
Precise insert operation by tactile controlled robot
A74-40116

DEHYDRATION
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759
DEPOLARIZATION
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator
[ASME PAPER 74-ENAS-53] A74-39146
DEPRESSANTS
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction
A74-40683
DIAGNOSIS
Evaluation of isoproterenol as a method of stress testing
A74-38121
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
DIASTOLE
Conduction defects in experimental atrial arrhythmia
A74-38124
DIETS
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469
DIFFUSION
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451
DIGITAL COMPUTERS
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument)
N74-29811
DIGITAL SIMULATION
Simulation by digital computer of walking machine control system
A74-39507
Control of a multi-legged vehicle
A74-39509
DIGITAL TECHNIQUES
Computer analysis of ultrasoundcardiograms
A74-38289
DIPOLE MOMENTS
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083
DISASTERS
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800
DISPLAY DEVICES
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510
DIVING (UNDERWATER)
Breathing mixtures --- for underwater diving apparatus
[AD-779302] N74-29456
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2
[DLR-FB-74-02] N74-30482
DRUGS
Treatment of systemic lupus erythematosus with azathioprine
[NASA-TT-F-15840] N74-30473
DYNAMIC CHARACTERISTICS
A model of cardiac muscle dynamics
A74-40678
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument)
N74-29811
DYNAMIC CONTROL
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465
Simulation by digital computer of walking machine control system
A74-39507
DYNAMIC RESPONSE
A user-oriented program for crash dynamics --- human response simulation for automobile accidents
A74-39782

E

EAR PRESSURE TEST
Transformation function of the external ear in response to impulsive stimulation
A74-38858
Upper limit to stapes displacement - Implications for hearing loss
A74-38859
EARPHONES
Loudness discomfort level under earphone and in the free field - The effects of calibration methods
A74-38856
EARTH ATMOSPHERE
Visual range of an object in the atmosphere
[BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
EARTH ORBITS
Life in weightlessness biological laboratories in orbit --- using Cosmos 605
[NASA-TT-F-15851] N74-29447
EARTH RESOURCES
Biology and remote sensing from spacecraft
A74-39277
Use of remote sensing in the study of Antarctic marine resources
A74-39278
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
ECHOCARDIOGRAPHY
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
Computer analysis of ultrasoundcardiograms
A74-38289
Use of echocardiography to evaluate cardiac performance
A74-39634
ECHOES
Mathematical models and electrophysiological studies of echolocation
[AD-779047] N74-29458
ECOLOGY
Ecological physiology of animals --- physiological adaptation to environment and micro-evolution of functions
[NASA-TT-F-14203] N74-30464
ECOSYSTEMS
Biology and remote sensing from spacecraft
A74-39277
EJECTION INJURIES
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats
A74-40281
Cardiac injuries resulting from ejection
A74-40282
EJECTION SEATS
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats
A74-40281
ELASTIC PROPERTIES
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle
A74-39637
ELECTRIC CHOPPERS
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument)
N74-29811
ELECTRIC STIMULI
Conduction defects in experimental atrial arrhythmia
A74-38124
Behavioral and neurochemical alterations induced by hypoxia in rats
A74-39374
ELECTROCARDIOGRAPHY
Characteristic biological sensors
A74-39414

ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462

ELECTROCHEMICAL CELLS
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation
[ASME PAPER 74-ENAS-9] A74-39117
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator
[ASME PAPER 74-ENAS-53] A74-39146

ELECTRODES
Characteristic biological sensors
A74-39414
Automated potentiometric electrolyte analysis system --- for use in weightlessness
[NASA-CR-134373] N74-30491

ELECTROENCEPHALOGRAPHY
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394
Coronal topography of human auditory evoked responses
A74-40447
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448
Comments on estimations and tests of EEG amplitude distributions
A74-40449
Characteristics of the average human Visual Evoked Response (VER)
[AD-779079] N74-30484

ELECTROKINETICS
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator
[ASME PAPER 74-ENAS-53] A74-39146

ELECTROLYSIS
Development of a prototype module for a non-cryogenic N2/O2 supply system
[ASME PAPER 74-ENAS-21] A74-39124
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141

ELECTROLYTE METABOLISM
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia
A74-38509
Continuous recording of multiple parameters during perfusion of human colon
A74-40758

ELECTROLYTES
Automated potentiometric electrolyte analysis system --- for use in weightlessness
[NASA-CR-134373] N74-30491

ELECTROLYTIC CELLS
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115

ELECTROMAGNETIC FIELDS
Electromagnetic signaling in animate nature
[JPRS-62434] N74-30478

ELECTRON MICROSCOPES
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components --- examined with a scanning electron microscope
[NASA-CR-139485] N74-30480

ELECTROPHORESIS
Role of gravity in preparative electrophoresis
N74-29914
Preparative electrophoresis of living lymphocytes
N74-29915

ELECTROPHYSIOLOGY
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345
Electrophysiological evidence for colour channels in human pattern vision
A74-38646
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats
A74-40450
Relationship of the functional refractory period to conduction in the atrioventricular node
A74-40679
Mathematical models and electrophysiological studies of echolocation
[AD-779047] N74-29458

ELECTRORETINOGRAPHY
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085

EMBRYOS
Observations of the embryonal rat pancreas during chronic hypoxia
A74-40439
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765

EMERGENCIES
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800

EMOTIONAL FACTORS
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440

ENDOCRINOLOGY
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900

ENERGY REQUIREMENTS
Myocardial energetics --- minute oxygen consumption
A74-39631

ENTROPY
Comments on papers by Reichert and Wong --- information theory for molecular taxonomy
A74-39247

ENVIRONMENT SIMULATION
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice
A74-39794

ENVIRONMENTAL CONTROL
Pulse-modulated dual-gas control subsystem for space cabin atmosphere
[ASME PAPER 74-ENAS-13] A74-39119
Development of a prototype module for a non-cryogenic N2/O2 supply system
[ASME PAPER 74-ENAS-21] A74-39124
Life support subsystem monitoring instrumentation
[ASME PAPER 74-ENAS-25] A74-39128
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140
Environmental control system development for manned spacecraft 1960-1973
[ASME PAPER 74-ENAS-50] A74-39143
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft
[ASME PAPER 74-ENAS-57] A74-39149

ENVIRONMENTAL ENGINEERING
Performance, recovery and man-machine effectiveness
[AD-777797] N74-29466

ENVIRONMENTAL SURVEYS
Biology and remote sensing from spacecraft
A74-39277

ENZYMES
Adaptation as a factor modifying the stability of enzymes
[NASA-TT-F-15505] N74-30474

ENZYMOLOGY
The energy aspect of the mechanism of enzyme action
[NASA-TT-F-15835] N74-30465

EPIDEMIOLOGY
Epidemiology of coronary heart disease among young Army males of World War II
A74-38123

ERROR ANALYSIS
Repetition effects in choice reaction time to multidimensional stimuli --- sequential visual discrimination
A74-40128

ERYTHROCYTES
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759
ESTIMATES
On the question of pilot deterioration during low altitude flight --- response to turbulence
[NASA-TT-F-15799] N74-30470
EVAPORATION RATE
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445
EXCRETION
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2
[DLR-FB-74-02] N74-30482
EXERCISE (PHYSIOLOGY)
Oxygen transport during exercise in human subjects
A74-38851
Field of vision and simple reaction time during recreation exercises at work
[NASA-TT-F-15828] N74-29464
EXOBIOLOGY
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components --- examined with a scanning electron microscope
[NASA-CR-139485] N74-30480
EYE (ANATOMY)
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-778736] N74-29455
EYE DOMINANCE
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change
A74-38086
EYE MOVEMENTS
Functional organization of the ocular motor system
A74-39798
EYE PROTECTION
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505
Evaluation of Air Force laser protective devices --- eye protection
[AD-779522] N74-29468
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470
EYEPIECES
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505

F

FABRICS
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279
FATIGUE (BIOLOGY)
The determination of stress and fatigue, taking into account the example of air traffic controllers
A74-40334
FEASIBILITY ANALYSIS
An experimental investigation of the role of motion in ground-based trainers --- pilot training devices
[AD-778665] N74-29471
FEEDBACK CONTROL
Modeling of human operator performance utilizing time series analysis
A74-40022
Precise insert operation by tactile controlled robot
A74-40116
Control processes in biology and technology
A74-40478
FEMALES
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469
FERROMAGNETISM
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208
FIGHTER AIRCRAFT
The deadly triad --- aircraft accident factors
A74-40278
FINITE DIFFERENCE THEORY
Plane oscillatory flow past rectangular obstacles
A74-38263
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model
A74-40766
FIRE DAMAGE
Toxicology of polymeric materials exposed to heat and fires
A74-38894
FIRE FIGHTING
Firefighter's compressed air breathing system pressure vessel development program
[NASA-CR-134384] N74-30497
FIRST AID
New concepts of medical facilities aboard large-capacity aircraft
A74-38506
FLASH BLINDNESS
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505
FLIGHT CREWS
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502
Reflections on the psychological selection of military aviation aircrew
A74-38504
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505
Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design
A74-38527
Deaths from burns in Army aircraft, 1965-1971
A74-40280
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286
FLIGHT FITNESS
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/
A74-38507
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438
FLIGHT SAFETY
Aviation pathology and the group system - A case of breakup in the air
A74-40277
FLIGHT STRESS (BIOLOGY)
Action of low frequency vibrations on cardiac quickness and variability
A74-38503
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440
FLOW DISTRIBUTION
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236
Sequence of regional filling during a tidal breath in man
A74-40754

FLOW RESISTANCE
Plane oscillatory flow past rectangular obstacles A74-38263
Intraventricular conduction defects in acute myocardial infarction A74-40473
FLUID FILTERS
Development of a filter regeneration system for advanced spacecraft fluid systems [ASME PAPER 74-ENAS-18] A74-39122
FLUORESCENCE
Fluorescent antibody detection of microorganisms in terrestrial environments [NASA-CR-139386] N74-30479
FLYING PERSONNEL
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation A74-40284
Feasibility of using special measures in the classification and assignment of lower mental ability airmen [AD-777831] N74-29467
FOOD
Skylab food system laboratory support [NASA-CR-134380] N74-30490
Space shuttle/food system study. Volume 2, Appendix A: Active heating system-screening analysis. Appendix B: Reconstituted food heating techniques analysis [NASA-CR-134375] N74-30492
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis [NASA-CR-134376] N74-30493
Space shuttle/food system study. Volume 2, Appendix F: Flight food and primary packaging [NASA-CR-134378] N74-30494
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis [NASA-CR-134379] N74-30495
FORCE DISTRIBUTION
Force-velocity studies in isolated and intact heart muscle A74-39630
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function A74-39636
FOVEA
Temporal tolerance of the foveal size of Panum's area A74-38082
FRACTIONATION
Role of gravity in preparative electrophoresis N74-29914
Preparative electrophoresis of living lymphocytes N74-29915
FRAGMENTATION
Fragmentation and identifiability of repeatedly presented brief visual stimuli A74-40131
FREE RADICALS
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia A74-38509
FREQUENCY MODULATION
Spectral sensitivity of the modulation-sensitive mechanism of vision A74-38084
Reaction of central auditory neurons to signals with different directions of frequency modulation A74-38343
FREQUENCY RESPONSE
The spatial selectivity of the tilt aftereffect --- retinal adaptation to gratings A74-38090
Latency of sound localization as a function of azimuth and frequency A74-40168
FROGS
Light-dependent phosphorylation of rhodopsin in living frogs A74-40422

G

GALLIUM ARSENIDE LASERS
The histopathology of chorioretinal lesions produced by the gallium arsenide laser [AD-778736] N74-29455
GANGLIA
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells A74-38345
GAS DETECTORS
Automated potentiometric electrolyte analysis system --- for use in weightlessness [NASA-CR-134373] N74-30491
GAS EXCHANGE
Effect of anesthesia on rate of N2 washout from body stores A74-40757
Respiratory gas exchange of high altitude adapted chick embryos A74-40765
GAS FLOW
Pulse-modulated dual-gas control subsystem for space cabin atmosphere [ASME PAPER 74-ENAS-13] A74-39119
GAS GENERATORS
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation [ASME PAPER 74-ENAS-9] A74-39117
GAS MIXTURES
Two-tracer method for rapid determination of residual volume --- of lungs A74-40764
Breathing mixtures --- for underwater diving apparatus [AD-779302] N74-29456
GAS PRESSURE
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects A74-40753
GAS TRANSPORT
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model A74-40766
GLUCOSE
Glucose-C/14/-OL metabolism in man after abrupt altitude exposure /4,300 m/ A74-39795
Glucose tolerance tests in rats exposed to varying altitude stress A74-39799
GOGGLES
The use of dynamic filtering as a means of laser eye protection [AD-779555] N74-29470
GRATINGS (SPECTRA)
The spatial selectivity of the tilt aftereffect --- retinal adaptation to gratings A74-38090
GRAVIRECEPTORS
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness [NASA-TT-F-15574] N74-30467
GRAVITATION
Predicting resistance to G-forces by the aid of a decompression functional test [NASA-TT-F-15823] N74-30471
GRAVITATIONAL EFFECTS
Role of gravity in preparative electrophoresis N74-29914
Gravitational biology [BIL-M-23358-(5828.4F)] N74-30457
GROUND SUPPORT SYSTEMS
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis [NASA-CR-134379] N74-30495

H

HABITATS
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana [PAPER-211] N74-30813

Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-212] N74-30814
HEAD (ANATOMY)
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394
HEALTH PHYSICS
Microwaves and man's safety --- Russian book
A74-38676
HEART DISEASES
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
Evaluation of isoproterenol as a method of stress testing
A74-38121
Coronary artery occlusion and blood lipids
A74-38122
Epidemiology of coronary heart disease among young Army males of World War II
A74-38123
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
Cardiac mechanics: Physiological, clinical, and mathematical considerations --- Book
A74-39626
Cardiac ultrastructure and function in the normal and failing heart
A74-39628
Clinical applications of angiocardiography
A74-39633
Systolic time intervals in the noninvasive assessment of left ventricular performance in man
A74-39635
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle
A74-39640
Cardiac injuries resulting from ejection
A74-40282
Myocarditis and the aircraft accident
A74-40283
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474
Mechanical and biochemical correlates of cardiac hypertrophy
A74-40685
HEART FUNCTION
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232
Computer analysis of ultrasoundcardiograms
A74-38289
Cardiac mechanics: Physiological, clinical, and mathematical considerations --- Book
A74-39626
Cardiac ultrastructure and function in the normal and failing heart
A74-39628
Biochemical basis for cardiac contraction
A74-39629
Use of echocardiography to evaluate cardiac performance
A74-39634
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle
A74-39637
Review of various theories for the evaluation of left ventricular wall stresses
A74-39639
Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle
A74-39640
Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations
A74-39642
Relationship of the functional refractory period to conduction in the atrioventricular node
A74-40679
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686
Intrathoracic and venous pressure relationships during responses to changes in body position
A74-40755
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
HEART MINUTE VOLUME
Limits of normal fluctuations of the basic hemodynamic indices in young men
A74-40799
HEART RATE
Action of low frequency vibrations on cardiac quickness and variability
A74-38503
Systolic time intervals in the noninvasive assessment of left ventricular performance in man
A74-39635
Frequency of feedback and learned heart rate control
A74-40167
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463
HEART VALVES
Topography of aortic heart valves --- applied to the development of a prosthetic heart valve
[NASA-CR-139566] N74-30476
HEAT EXCHANGERS
Bosch CO2 reduction unit power studies
[ASME PAPER 74-ENAS-55] A74-39148
HEAT PIPES
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134
Space Shuttle heat pipe thermal control systems design and test
[ASME PAPER 74-ENAS-38] A74-39135
HEAT TOLERANCE
Symposium on Heat Stress and Heat Acclimatization
[AD-777700] N74-29449
HEAT TRANSFER
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500
HEATING EQUIPMENT
Space shuttle/food system study. Volume 2, Appendix A: Active heating system-screening analysis. Appendix B: Reconstituted food heating techniques analysis
[NASA-CR-134375] N74-30492
HEMATOCRIT
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat
A74-39791
HEMODYNAMIC RESPONSES
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793
Extent of myocardial flow from luminal collateral circulation
A74-40763
HEMODYNAMICS
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function
A74-39636

Limits of normal fluctuations of the basic hemodynamic indices in young men A74-40799

HEMOGLOBIN
Oxygen transport during exercise in human subjects A74-38851

HIBERNATION
Nucleic acid content in the neuron-neuroglia system of the superoptic nucleus of the hypothalamus of hibernating Siberian marmots A74-40899

HIGH ALTITUDE ENVIRONMENTS
Effect of prolonged stay at altitude /4000 m/ on autonomic balance A74-39797
Respiratory gas exchange of high altitude adapted chick embryos A74-40765

HIGH GRAVITY ENVIRONMENTS
Stability of the intracranial circulation in an altered gravitational field A74-39796

HIPPOCAMPUS
Correlation of hippocampal theta rhythm with changes in cutaneous temperature --- evoked neuron response in thermoregulation [NASA-CR-139527] N74-30461
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature [NASA-CR-139526] N74-30462

HISTOLOGY
The histopathology of chorioretinal lesions produced by the gallium arsenide laser [AD-778736] N74-29455

HORMONE METABOLISMS
Behavioral and neurochemical alterations induced by hypoxia in rats A74-39374

HUMAN BEHAVIOR
Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race A74-40441

HUMAN BEINGS
Circadian variation in presumably heathly young soldiers [NASA-CR-139234] N74-29452
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument) N74-29811

HUMAN BODY
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account N74-29799
Microwave reflection, diffraction and transmission studies of man [AD-780226] N74-30501

HUMAN FACTORS ENGINEERING
Visual elements of the ergonomic evaluation of a new integrated instrument panel A74-38510
Control by generalized visual images A74-39469
Modes of control and the limits of control capability for human subjects A74-40024
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats A74-40281
Summary of the Human Engineering Laboratory's air-to-ground target detection studies using stationary targets [AD-779409] N74-29469

HUMAN PATHOLOGY
Joint Committee on Aviation Pathology, Scientific Session, 8th, U.S. Air Force Academy, Colorado Springs, Colo., October 8-11, 1972, Proceedings A74-40276
Aviation pathology and the group system - A case of breakup in the air A74-40277
Cardiac injuries resulting from ejection A74-40282
Myocarditis and the aircraft accident A74-40283
Modern views on oxygen toxicity A74-40442
The development of myopia in persons working with computer equipment A74-40800

HUMAN PERFORMANCE
Oxygen transport during exercise in human subjects A74-38851
Judgments about the duration of brief stimuli --- in visual discrimination A74-40127
Repetition effects in choice reaction time to multidimensional stimuli --- sequential visual discrimination A74-40128
Detectability of relative motion as a function of exposure duration, angular separation, and background A74-40169
Comparison of performance with headphone and free-field noise A74-40170
The significance of cumulative coriolis acceleration for tests for expert medical selection --- using 376 men [NASA-TT-F-15824] N74-29448
Performance, recovery and man-machine effectiveness [AD-777797] N74-29466

HUMAN REACTIONS
A model of heat transfer in immersed man A74-38911
A user-oriented program for crash dynamics --- human response simulation for automobile accidents A74-39782
Photographic analysis of human startle reaction to sonic booms A74-39789
Effects of aircraft noise on man A74-40091
Physiological responses in air traffic control personnel: Houston Intercontinental Tower --- adapation to stress [AD-777838] N74-29465

HUMAN TOLERANCES
Temporal tolerance of the foveal size of Panum's area A74-38082
Loudness discomfort level under earphone and in the free field - The effects of calibration methods A74-38856
Upper limit to stapes displacement - Implications for hearing loss A74-38859
Predicting resistance to G-forces by the aid of a decompression functional test [NASA-TT-F-15823] N74-30471

HUMAN WASTES
Integrated water and waste management system for future spacecraft [ASME PAPER 74-ENAS-10] A74-39118
Bosch CO2 reduction unit power studies [ASME PAPER 74-ENAS-55] A74-39148

HYDROCARBONS
The degradation of oil in continuous culture [AD-780234] N74-30485

HYDROGEN
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation [ASME PAPER 74-ENAS-9] A74-39117

HYDROXYCORTICOSTEROID
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2 [DLR-FB-74-02] N74-30482

HYGIENE
Design, fabrication and acceptance testing of a zero gravity whole body shower [ASME PAPER 74-ENAS-51] A74-39144

HYPERCAPNIA
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia A74-39375

HYPERGLYCEMIA
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/ A74-39795
Glucose tolerance tests in rats exposed to varying altitude stress A74-39799
HYPEROXIA
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia A74-38509
Modern views on oxygen toxicity A74-40442
Oxygen toxicity [AD-779282] N74-29453
HYPERTENSION
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture A74-40684
HYPERTHERMIA
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2 A74-40904
HYPOKINESIA
Effect of hypokinesis and enforced posture on human perception of time A74-40797
HYPOTHALAMUS
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys A74-38600
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots A74-40899
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2 A74-40904
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature [NASA-CR-139526] N74-30462
HYPOXIA
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia A74-38509
Behavioral and neurochemical alterations induced by hypoxia in rats A74-39374
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia A74-39375
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat A74-39791
Observations of the embryonal rat pancreas during chronic hypoxia A74-40439
Hypoxic pulmonary vasoconstriction in the rat - The necessary role of angiotensin II A74-40681
Influence of altered gaseous environments on lung metabolism [AD-779048] N74-30483

I

IMAGING TECHNIQUES
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections A74-39821
IMMUNOLOGY
Plasma cell surface antigen on human blood lymphocytes A74-39380
IN-FLIGHT MONITORING
The Manned Spacecraft Center and medical technology A74-38703
INFECTIOUS DISEASES
Outline of experimental aeromicrobiology --- Russian book A74-38048
Recovery of medically important microorganisms from Apollo astronauts A74-39792
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice A74-39794
INFORMATION SYSTEMS
Modes of control and the limits of control capability for human subjects A74-40024
INFORMATION THEORY
Conservation of Shannon's redundancy for proteins --- information theory applied to amino acid sequences A74-39244
Comments on papers by Reichert and Wong --- information theory for molecular taxonomy A74-39247
INSULIN
Observations of the embryonal rat pancreas during chronic hypoxia A74-40439
INTERPLANETARY SPACECRAFT
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components --- examined with a scanning electron microscope [NASA-CR-139485] N74-30480
INTESTINES
Continuous recording of multiple parameters during perfusion of human colon A74-40758
INVERTEBRATES
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness [NASA-TT-F-15574] N74-30467
IODINE
An automated water iodinating subsystem for manned space flight [ASME PAPER 74-ENAS-54] A74-39147
ISCHEMIA
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides A74-40682

K

KRYPTON 85
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog A74-40464

L

LACTATES
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents A74-40285
LASERS
Evaluation of Air Force laser protective devices --- eye protection [AD-779522] N74-29468
The use of dynamic filtering as a means of laser eye protection [AD-779555] N74-29470
LEG (ANATOMY)
A theoretical study of gaits for legged locomotion systems N74-30455
LESIONS
Treatment of systemic lupus erythematosus with azathioprine [NASA-TT-F-15840] N74-30473
LIFE SUPPORT SYSTEMS
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems [ASME PAPER 74-ENAS-2] A74-39115
Pulse-modulated dual-gas control subsystem for space cabin atmosphere [ASME PAPER 74-ENAS-13] A74-39119

Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application
[ASME PAPER 74-ENAS-16] A74-39120
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
Life support subsystem monitoring instrumentation
[ASME PAPER 74-ENAS-25] A74-39128
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140
Environmental control system development for manned spacecraft 1960-1973
[ASME PAPER 74-ENAS-50] A74-39143
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147
Skylab food system laboratory support
[NASA-CR-134380] N74-30490
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498

LIGHT ADAPTATION
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134

LINEAR ACCELERATORS
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness
[NASA-TT-F-15574] N74-30467

LINEAR EQUATIONS
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

LIPID METABOLISM
Coronary artery occlusion and blood lipids
A74-38122

LIVER
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438

LOCOMOTION
A theoretical study of gaits for legged locomotion systems
N74-30455

LOCUSTS
ERTS surveys a 500 km squared locust breeding site in Saudi Arabia --- Red Sea coastal plain
[PAPER-A15] N74-30722

LOUDNESS
Loudness discomfort level under earphone and in the free field - The effects of calibration methods
A74-38856

LOUDSPEAKERS
Latency of sound localization as a function of azimuth and frequency
A74-40168

LOW PRESSURE
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793

LUMENS
Extent of myocardial flow from luminal collateral circulation
A74-40763

LUMINANCE
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity
A74-38088

LUMINOUS INTENSITY
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083

LUNG MORPHOLOGY
Sequence of regional filling during a tidal breath in man
A74-40754

LUNGS
Fluid flow in a model alveolar sac
A74-40760
Two-tracer method for rapid determination of residual volume --- of lungs
A74-40764
Influence of altered gaseous environments on lung metabolism
[AD-779048] N74-30483

LYMPHOCYTES
Plasma cell surface antigen on human blood lymphocytes
A74-39380
Preparative electrophoresis of living lymphocytes
N74-29915

M

MAGNETIC INDUCTION
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208

MAN MACHINE SYSTEMS
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510
Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design
A74-38527
Control by generalized visual images
A74-39469
A transfer function approach to human operator skill development
A74-39505
The multi-moded remote manipulator system
A74-39510
Modeling of human operator performance utilizing time series analysis
A74-40022
Modes of control and the limits of control capability for human subjects
A74-40024
Telemanipulators - A facility for conquering space by man
A74-40117
Certain methodological approaches to studying pilot activity errors
A74-40798
Manipulator system man-machine interface evaluation program --- technology assessment
[NASA-CR-120218] N74-29459
Performance, recovery and man-machine effectiveness
[AD-777797] N74-29466
Man-operator in space --- concerning the physiological and psychological factors affecting performance
[NASA-TT-F-15714] N74-30488

MANIPULATORS
The multi-moded remote manipulator system
A74-39510
The right robot for the right job
A74-40115
Telemanipulators - A facility for conquering space by man
A74-40117
Manipulator system man-machine interface evaluation program --- technology assessment
[NASA-CR-120218] N74-29459

MANNED SPACE FLIGHT
An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147
Man-operator in space --- concerning the physiological and psychological factors affecting performance
[NASA-TT-F-15714] N74-30488

MANNED SPACECRAFT
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115
Environmental control system development for manned spacecraft 1960-1973
[ASME PAPER 74-ENAS-50] A74-39143

MANUAL CONTROL
Modes of control and the limits of control capability for human subjects
A74-40024

MARINE BIOLOGY
Use of remote sensing in the study of Antarctic marine resources A74-39278
Assessing the abundance and biomass of phytoplankton by means of electronic computers [BLL-RTS-8914] N74-30454
MASKING
The effect of masker duration on forward and backward masking A74-40126
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking A74-40166
MATHEMATICAL MODELS
Thermal analysis of the Skylab airlock module [ASME PAPER 74-ENAS-40] A74-39137
Legged locomotion robots - Mathematical models, control algorithms and realizations A74-39465
A transfer function approach to human operator skill development A74-39505
Modeling of human operator performance utilizing time series analysis A74-40022
Combined method for studying the quality, 'roughness', and stability of ergatic control systems A74-40661
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model A74-40766
Mathematical model of behavior developed on the basis of the theory of set [AD-776128] N74-29450
Mathematical models and electrophysiological studies of echolocation [AD-779047] N74-29458
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account N74-29799
Visual range of an object in the atmosphere [BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
MECHANICAL IMPEDANCE
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument) N74-29811
MECHANICAL PROPERTIES
Mechanical and biochemical correlates of cardiac hypertrophy A74-40685
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle A74-40903
MEDICAL SERVICES
New concepts of medical facilities aboard large-capacity aircraft A74-38506
MEMBRANES
NS-100 membranes for reverse osmosis applications [ASME PAPER 74-ENAS-1] A74-39114
MEMORY
Memory for random shapes - A dual-task analysis --- in visual data processing A74-40165
MENTAL PERFORMANCE
Feasibility of using special measures in the classification and assignment of lower mental ability airmen [AD-777831] N74-29467
METABOLISM
Alterations in cellular and metabolic processes [NASA-CR-139398] N74-30475
Influence of altered gaseous environments on lung metabolism [AD-779048] N74-30483
METAL IONS
Silver ion bactericide system --- for Space Shuttle Orbiter potable water [ASME PAPER 74-ENAS-49] A74-39142
MICROBIOLOGY
Outline of experimental aeromicrobiology --- Russian book A74-38048
MICROELECTRONICS
Microelectronic bioinstrumentation system [NASA-CR-139216] N74-29463
MICROORGANISMS
Recovery of medically important microorganisms from Apollo astronauts A74-39792
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components [NASA-CR-138895] N74-29446
A study of psychrophilic organisms isolated from the manufacture and assembly areas of spacecraft to be used in the Viking mission [NASA-CR-139390] N74-30477
Fluorescent antibody detection of microorganisms in terrestrial environments [NASA-CR-139386] N74-30479
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components --- examined with a scanning electron microscope [NASA-CR-139485] N74-30480
MICROWAVES
Microwaves and man's safety --- Russian book A74-38676
Microwave reflection, diffraction and transmission studies of man [AD-780226] N74-30501
MIDDLE EAR PRESSURE
Upper limit to stapes displacement - Implications for hearing loss A74-38859
MILITARY AIRCRAFT
Deaths from burns in Army aircraft, 1965-1971 A74-40280
MILITARY PSYCHOLOGY
Reflections on the psychological selection of military aviation aircrew A74-38504
MOLECULAR BIOLOGY
Conservation of Shannon's redundancy for proteins --- information theory applied to amino acid sequences A74-39244
MONTANA
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana [PAPER-E11] N74-30813
MORPHOLOGY
Alterations in cellular and metabolic processes [NASA-CR-139398] N74-30475
MOTION PERCEPTION
Induced stereomovement --- visual perception of rotationally distorted shapes A74-38080
Tactile movement detection and discrimination following dorsal column lesions in monkeys A74-39251
Proximal velocity change as a determinant of space perception A74-40130
Detectability of relative motion as a function of exposure duration, angular separation, and background A74-40169
MOTION SIMULATORS
An experimental investigation of the role of motion in ground-based trainers --- pilot training devices [AD-778665] N74-29471
MULTISPECTRAL PHOTOGRAPHY
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana [PAPER-E11] N74-30813
MUSCLES
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle A74-40903
MUSCULAR FUNCTION
A model of cardiac muscle dynamics A74-40678

Pressures developed by loaded inspiratory muscles in conscious and anesthetized man
A74-40756

MUSCULOSKELETAL SYSTEM
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394

MYOCARDIAL INFARCTION
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
Intraventricular conduction defects in acute myocardial infarction
A74-40473

MYOCARDIUM
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232
Challenges to the adenosine hypothesis for the regulation of coronary blood flow
A74-38233
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236
Cardiac mechanics: Physiological, clinical, and mathematical considerations --- Book
A74-39626
Basic terminology and formulae for left ventricular wall stress
A74-39627
Cardiac ultrastructure and function in the normal and failing heart
A74-39628
Biochemical basis for cardiac contraction
A74-39629
Force-velocity studies in isolated and intact heart muscle
A74-39630
Myocardial energetics --- minute oxygen consumption
A74-39631
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function
A74-39636
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle
A74-39637
Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle
A74-39640
Rheological modeling of the intact left ventricle
A74-39641
Myocarditis and the aircraft accident
A74-40283
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog
A74-40464
Left ventricular volume as a determinant of myocardial oxygen consumption
A74-40465
A model of cardiac muscle dynamics
A74-40678
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction
A74-40683
Mechanical and biochemical correlates of cardiac hypertrophy
A74-40685
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686
Extent of myocardial flow from luminal collateral circulation
A74-40763

MYOPIA
The development of myopia in persons working with computer equipment
A74-40800

N

NEURAL NETS
Correlation of hippocampal theta rhythm with changes in cutaneous temperature --- evoked neuron response in thermoregulation
[NASA-CR-139527] N74-30461

NEUROGLIA
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots
A74-40899

NEURONS
Reaction of central auditory neurons to signals with different directions of frequency modulation
A74-38343
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats
A74-40450
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots
A74-40899

NEUROPHYSIOLOGY
Reaction of central auditory neurons to signals with different directions of frequency modulation
A74-38343
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345
Functional organization of the ocular motor system
A74-39798
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats
A74-40450
Fabrication of neurophysiological monitoring systems
[NASA-CR-2416] N74-29461

NITROGEN
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation
[ASME PAPER 74-ENAS-9] A74-39117

NITROGEN METABOLISM
Effect of anesthesia on rate of N2 washout from body stores
A74-40757

NOCTURNAL VARIATIONS
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448

NOISE (SOUND)
The effect of masker duration on forward and backward masking
A74-40126

NOISE INTENSITY
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472
Transformation function of the external ear in response to impulsive stimulation
A74-38858

NOISE REDUCTION
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140

NOISE TOLERANCE
Upper limit to stapes displacement - Implications for hearing loss
A74-38859
Comparison of performance with headphone and free-field noise
A74-40170
NUCLEIC ACIDS
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots
A74-40899
Study of antinuclear antibodies in subjects with photodermatitis --- antibody response to nucleic acids irradiated with ultraviolet radiation
[NASA-TT-F-15844] N74-30466
NUMERICAL CONTROL
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465
Simulation by digital computer of walking machine control system
A74-39507
Control of a multi-legged vehicle
A74-39509
NUTRIENTS
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500

O

OBESITY
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
OCCIPITAL LOBES
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448
OCCLUSION
Coronary artery occlusion and blood lipids
A74-38122
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
OCCUPATION
The development of myopia in persons working with computer equipment
A74-40800
OCULOMOTOR NERVES
Functional organization of the ocular motor system
A74-39798
OILS
The degradation of oil in continuous culture
[AD-780234] N74-30485
OPERATOR PERFORMANCE
Control by generalized visual images
A74-39469
A transfer function approach to human operator skill development
A74-39505
The multi-moded remote manipulator system
A74-39510
Modeling of human operator performance utilizing time series analysis
A74-40022
Modes of control and the limits of control capability for human subjects
A74-40024
The determination of stress and fatigue, taking into account the example of air traffic controllers
A74-40334
Man-operator in space --- concerning the physiological and psychological factors affecting performance
[NASA-TT-F-15714] N74-30488
OPERATORS (PERSONNEL)
Combined method for studying the quality, 'roughness', and stability of ergatic control systems
A74-40661
Field of vision and simple reaction time during recreation exercises at work
[NASA-TT-F-15828] N74-29464
OPTICAL FILTERS
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470
OPTICAL PROPERTIES
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
OPTICAL TRACKING
Functional organization of the ocular motor system
A74-39798
OPTIMAL CONTROL
Combined method for studying the quality, 'roughness', and stability of ergatic control systems
A74-40661
ORBITAL WORKSHOPS
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
ORGANISMS
Gravitational biology
[BLL-M-23358-(5828.4F)] N74-30457
ORGANS
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia
A74-38509
ORTHOSTATIC TOLERANCE
Apollo space crew cardiovascular evaluations
A74-39790
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793
OSCILLATING FLOW
Plane oscillatory flow past rectangular obstacles
A74-38263
OSMOSIS
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114
OXYGEN
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753
OXYGEN BREATHING
Effect of anesthesia on rate of N2 washout from body stores
A74-40757
OXYGEN CONSUMPTION
Myocardial energetics --- minute oxygen consumption
A74-39631
Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations
A74-39642
Left ventricular volume as a determinant of myocardial oxygen consumption
A74-40465
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451
Oxygen toxicity
[AD-779282] N74-29453
Photorespiration and the primary reactions of photosynthesis
[BLL-BRIC-TRANS-3293-(3623.66)] N74-30460
OXYGEN METABOLISM
Role of O2 in control of the coronary capillary reserve
A74-38235
Oxygen transport during exercise in human subjects
A74-38851
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468

OXYGEN PRODUCTION
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115
OXYGEN SUPPLY EQUIPMENT
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115
Breathing mixtures --- for underwater diving apparatus
[AD-779302] N74-29456
Improved fireman's compressed air breathing system pressure vessel development program
[NASA-CR-134385] N74-30496
OXYGEN TENSION
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice
A74-39794
Modern views on oxygen toxicity
A74-40442
OZONE
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893

P

PACKAGING
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis
[NASA-CR-134376] N74-30493
Space shuttle/food system study. Volume 2, Appendix F: Flight food and primary packaging
[NASA-CR-134378] N74-30494
PANCREAS
Observations of the embryonal rat pancreas during chronic hypoxia
A74-40439
PASSENGER AIRCRAFT
Ride quality evaluation 1: Questionnaire studies of airline passenger comfort
[NASA-CR-139368] N74-29460
PASSENGERS
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286
PATHOLOGICAL EFFECTS
Tactile movement detection and discrimination following dorsal column lesions in monkeys
A74-39251
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice
A74-39794
PATHOLOGY
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-778736] N74-29455
PATTERN RECOGNITION
Electrophysiological evidence for colour channels in human pattern vision
A74-38646
Fragmentation and identifiability of repeatedly presented brief visual stimuli
A74-40131
PERFORMANCE TESTS
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139
PERIPHERAL CIRCULATION
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
PERIPHERAL VISION
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134
PERSONNEL SELECTION
Feasibility of using special measures in the classification and assignment of lower mental ability airmen
[AD-777831] N74-29467
PHARMACOLOGY
Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat
A74-40680
Hypoxic pulmonary vasoconstriction in the rat - The necessary role of angiotensin II
A74-40681
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides
A74-40682
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction
A74-40683
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904
PHOSPHORYLATION
Light-dependent phosphorylation of rhodopsin in living frogs
A74-40427
PHOTOCHEMICAL REACTIONS
Light-dependent phosphorylation of rhodopsin in living frogs
A74-40427
PHOTOGRAPHIC MEASUREMENT
Photographic analysis of human startle reaction to sonic booms
A74-39789
PHOTOMAPPING
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana
[PAPER-E11] N74-30813
PHOTORECEPTORS
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085
PHOTOSENSITIVITY
Spectral sensitivity of the modulation-sensitive mechanism of vision
A74-38084
PHOTOSYNTHESIS
Photorespiration and the primary reactions of photosynthesis
[BLL-DRIC-TRANS-3293-(3623.66)] N74-30460
PHYSICAL EXERCISE
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468
PHYSICIANS
The doctor-pilot relationship
A74-38508
PHYSIOLOGICAL ACCELERATION
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle
A74-40903
PHYSIOLOGICAL FACTORS
Epidemiology of coronary heart disease among young Army males of World War II
A74-38123
Effects of aircraft noise on man
A74-40091
Man-operator in space --- concerning the physiological and psychological factors affecting performance
[NASA-TT-F-15714] N74-30488
PHYSIOLOGICAL RESPONSES
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290

Photographic analysis of human startle reaction to sonic booms
A74-39789
Physiological responses in air traffic control personnel: Houston Intercontinental Tower --- adaptation to stress
[AD-777838] N74-29465
Periodic (seasonal and yearly) changes in the organism of rats: Their causes and effects
[NASA-TT-F-14101] N74-30463
Ecological physiology of animals --- physiological adaptation to environment and micro-evolution of functions
[NASA-TT-F-14203] N74-30464
Influence of altered gaseous environments on lung metabolism
[AD-779048] N74-30483
Characteristics of the average human Visual Evoked Response (VER)
[AD-779079] N74-30484

PHYSIOLOGICAL TESTS
Evaluation of isoproterenol as a method of stress testing
A74-38121
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438

PILOT ERROR
Aviation pathology and the group system - A case of breakup in the air
A74-40277
The deadly triad --- aircraft accident factors
A74-40278
Certain methodological approaches to studying pilot activity errors
A74-40798

PILOT PERFORMANCE
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/
A74-38507
The doctor-pilot relationship
A74-38508
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438
On the question of pilot deterioration during low altitude flight --- response to turbulence
[NASA-TT-F-15799] N74-30470

PILOT SELECTION
Reflections on the psychological selection of military aviation aircrew
A74-38504
Myocarditis and the aircraft accident
A74-40283

PILOT TRAINING
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440
Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race
A74-40441
An experimental investigation of the role of motion in ground-based trainers --- pilot training devices
[AD-778665] N74-29471

PITUITARY GLAND
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen
A74-38915

PLANKTON
Use of remote sensing in the study of Antarctic marine resources
A74-39278
Assessing the abundance and biomass of phytoplankton by means of electronic computers
[BLL-RTS-8914] N74-30454

PLANTS (BOTANY)
Photorespiration and the primary reactions of photosynthesis
[BLL-DRIC-TRANS-3293-(3623.66)] N74-30460
Plant adaptation to cold. 1: Chlorophyll. 2: Minerals
[NASA-CR-139528] N74-30481

PNEUMATIC CONTROL
Control processes in biology and technology
A74-40478

POCKET MICE
Research on the properties of circadian systems amenable to study in space --- using pocket mice in Skylab experiment S-071 for the study of the effects of prolonged weightlessness
[NASA-CR-137523] N74-30489

POLYMERIC FILMS
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114

POLYMERS
Toxicology of polymeric materials exposed to heat and fires
A74-38894

POSITIONING DEVICES (MACHINERY)
Precise insert operation by tactile controlled robot
A74-40116

POSTURE
Intrathoracic and venous pressure relationships during responses to changes in body position
A74-40755
Effect of hypokinesis and enforced posture on human perception of time
A74-40797

POTABLE WATER
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
Silver ion bactericide system --- for Space Shuttle Orbiter potable water
[ASME PAPER 74-ENAS-49] A74-39142

POTASSIUM
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285

PRESSURE EFFECTS
Photographic analysis of human startle reaction to sonic booms
A74-39789

PRESSURE MEASUREMENTS
Continuous recording of multiple parameters during perfusion of human colon
A74-40758

PRESSURE PULSES
Pressures developed by loaded inspiratory muscles in conscious and anesthetized man
A74-40756

PRESSURE REDUCTION
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468

PRESSURE VESSELS
Improved fireman's compressed air breathing system pressure vessel development program
[NASA-CR-134385] N74-30496
Firefighter's compressed air breathing system pressure vessel development program
[NASA-CR-134384] N74-30497

PROSTHETIC DEVICES
Topography of aortic heart valves --- applied to the development of a prosthetic heart valve
[NASA-CR-139566] N74-30476

PROTECTIVE CLOTHING
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279

PROTEINS
Conservation of Shannon's redundancy for proteins --- information theory applied to amino acid sequences
A74-39244
Comments on papers by Reichert and Wong --- information theory for molecular taxonomy
A74-39247
Biochemical basis for cardiac contraction
A74-39629

Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat A74-40680

PROTOTYPES
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
Space station prototype Sabatier reactor design verification testing
[ASME PAPER 74-ENAS-58] A74-39150

PSYCHOACOUSTICS
Loudness discomfort level under earphone and in the free field - The effects of calibration methods A74-38856
The effect of masker duration on forward and backward masking A74-40126

PSYCHOLOGICAL EFFECTS
Characteristics of the average human Visual Evoked Response (VER)
[AD-779079] N74-30484

PSYCHOLOGICAL FACTORS
The doctor-pilot relationship A74-38508
Effects of aircraft noise on man A74-40091
Effect of hypokinesis and enforced posture on human perception of time A74-40797
Certain methodological approaches to studying pilot activity errors A74-40798
Man-operator in space --- concerning the physiological and psychological factors affecting performance
[NASA-TT-F-15714] N74-30488

PSYCHOLOGICAL TESTS
The effect of intensity on the localization of different acoustical stimuli in the vertical plane A74-38472
Reflections on the psychological selection of military aviation aircrew A74-38504
The determination of stress and fatigue, taking into account the example of air traffic controllers A74-40334
Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race A74-40441

PSYCHOMETRICS
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity A74-38088

PSYCHOPHYSICS
Dark adaptation of separate cone systems studied with psychophysics and electroretinography A74-38085

PULMONARY CIRCULATION
Estimation of stroke volume from the pulmonary artery pressure record A74-40463
Hypoxic pulmonary vasoconstriction in the rat - The necessary role of angiotensin II A74-40681

PULMONARY LESIONS
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations A74-40893

PULSE FREQUENCY MODULATION
Pulse-modulated dual-gas control subsystem for space cabin atmosphere
[ASME PAPER 74-ENAS-13] A74-39119

PYROLYSIS
Toxicology of polymeric materials exposed to heat and fires A74-38894

Q

QUALITY CONTROL
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498

R

RABBITS
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462

RACE FACTORS
Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race A74-40441

RADIATION HAZARDS
Microwaves and man's safety --- Russian book A74-38676

RADIATION INJURIES
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-778736] N74-29455

RADIO CONTROL
VIRGULE - A rescue vehicle of the new teleoperator generation A74-40118

RADIOBIOLOGY
Microwave reflection, diffraction and transmission studies of man
[AD-780226] N74-30501

RADIOISOTOPE BATTERIES
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116

RATS
Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486

REACTION TIME
Repetition effects in choice reaction time to multidimensional stimuli --- sequential visual discrimination A74-40128
Field of vision and simple reaction time during recreation exercises at work
[NASA-TT-F-15828] N74-29464

REACTOR DESIGN
Space station prototype Sabatier reactor design verification testing
[ASME PAPER 74-ENAS-58] A74-39150

REBREATHING
Two-tracer method for rapid determination of residual volume --- of lungs A74-40764

RECEPTORS (PHYSIOLOGY)
Electrophysiological evidence for colour channels in human pattern vision A74-38646
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction A74-40683

RED SEA
ERTS surveys a 500 km squared locust breeding site in Saudi Arabia --- Red Sea coastal plain
[PAPER-A15] N74-30722

REDUNDANCY ENCODING
Conservation of Shannon's redundancy for proteins --- information theory applied to amino acid sequences A74-39244

REFLEXES
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia A74-39375

REFRACTORY PERIOD
Relationship of the functional refractory period to conduction in the atrioventricular node A74-40679

REGENERATION (ENGINEERING)
Development of a filter regeneration system for advanced spacecraft fluid systems
[ASME PAPER 74-ENAS-18] A74-39122
REMOTE HANDLING
The multi-moded remote manipulator system
A74-39510
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118
REMOTE SENSORS
Life support subsystem monitoring instrumentation
[ASME PAPER 74-ENAS-25] A74-39128
Biology and remote sensing from spacecraft
A74-39277
Use of remote sensing in the study of Antarctic marine resources
A74-39278
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
REPETITION
Repetition effects in choice reaction time to multidimensional stimuli --- sequential visual discrimination
A74-40128
Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486
RESCUE OPERATIONS
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118
RESEARCH AND DEVELOPMENT
The Manned Spacecraft Center and medical technology
A74-38703
RESEARCH FACILITIES
Scientific projects at Pushchino Biological Study Center --- biological research
N74-30846
RESEARCH PROJECTS
Scientific projects at Pushchino Biological Study Center --- biological research
N74-30846
RESPIRATION
Photorespiration and the primary reactions of photosynthesis
[BLL-DRIC-TRANS-3293-(3623.66)] N74-30460
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
RESPIRATORY DISEASES
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893
RESPIRATORY IMPEDANCE
Deaths from burns in Army aircraft, 1965-1971
A74-40280
Pressures developed by loaded inspiratory muscles in conscious and anesthetized man
A74-40756
RESPIRATORY PHYSIOLOGY
Sequence of regional filling during a tidal breath in man
A74-40754
Fluid flow in a model alveolar sac
A74-40760
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765
RESPIRATORY RATE
Characteristic biological sensors
A74-39414
RESPIRATORY SYSTEM
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model
A74-40766
RETENTION (PSYCHOLOGY)
Memory for random shapes - A dual-task analysis --- in visual data processing
A74-40165
RETINA
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345
RETINAL ADAPTATION
Sensitization by annular surrounds - Sensitization and the contrast-flash effect
A74-38081
The spatial selectivity of the tilt aftereffect --- retinal adaptation to gratings
A74-38090
Light-dependent phosphorylation of rhodopsin in living frogs
A74-40422
RETINAL IMAGES
Temporal tolerance of the foveal size of Panum's area
A74-38082
Fragmentation and identifiability of repeatedly presented brief visual stimuli
A74-40131
RHEOLOGY
Rheological modeling of the intact left ventricle
A74-39641
RHEOMETERS
Limits of normal fluctuations of the basic hemodynamic indices in young men
A74-40799
RHYTHM (BIOLOGY)
Action of low frequency vibrations on cardiac quickness and variability
A74-38503
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
Electromagnetic signaling in animate nature
[JPRS-62434] N74-30478
ROBOTS
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465
Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings
A74-40114
The right robot for the right job
A74-40115
Precise insert operation by tactile controlled robot
A74-40116
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118
RODENTS
Periodic (seasonal and yearly) changes in the organism of rats: Their causes and effects
[NASA-TT-F-14101] N74-30463

S

SABATIER REACTION
Space station prototype Sabatier reactor design verification testing
[ASME PAPER 74-ENAS-58] A74-39150
SACCADIC EYE MOVEMENTS
Direction perception and human fixation eye movements
A74-38087
SAFETY DEVICES
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470
SAFETY MANAGEMENT
Microwaves and man's safety --- Russian book
A74-38676
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
SATELLITE TEMPERATURE
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137
SATELLITE-BORNE PHOTOGRAPHY
Biology and remote sensing from spacecraft
A74-39277

SAUDI ARABIA
ERTS surveys a 500 km squared locust breeding site in Saudi Arabia --- Red Sea coastal plain
[PAPER-A15] N74-30722
SEALS (ANIMALS)
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
SENSITIZING
Sensitization by annular surrounds - Sensitization and the contrast-flash effect
A74-38081
SENSORIMOTOR PERFORMANCE
Tactile movement detection and discrimination following dorsal column lesions in monkeys
A74-39251
SENSORY DISCRIMINATION
Can attention be allocated to sensory modalities --- simultaneous visual, auditory and tactile information processing
A74-40129
SENSORY FEEDBACK
Frequency of feedback and learned heart rate control
A74-40167
SENSORY STIMULATION
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761
SEQUENTIAL CONTROL
Precise insert operation by tactile controlled robot
A74-40116
SERVOCONTROL
The right robot for the right job
A74-40115
SET THEORY
Mathematical model of behavior developed on the basis of the theory of set
[AD-776128] N74-29450
SEWAGE
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141
SHELL THEORY
Review of various theories for the evaluation of left ventricular wall stresses
A74-39639
SIGNAL ANALYSIS
Comments on estimations and tests of EEG amplitude distributions
A74-40449
SILVER
Silver ion bactericide system --- for Space Shuttle Orbiter potable water
[ASME PAPER 74-ENAS-49] A74-39142
SKIN (ANATOMY)
Treatment of systemic lupus erythematosus with azathioprine
[NASA-TT-F-15840] N74-30473
SKIN TEMPERATURE (BIOLOGY)
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761
SKYLAB PROGRAM
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137
Research on the properties of circadian systems amenable to study in space --- using pocket mice in Skylab experiment S-071 for the study of the effects of prolonged weightlessness
[NASA-CR-137523] N74-30489
Skylab food system laboratory support
[NASA-CR-134380] N74-30490
SLEEP
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448
Dissociation of slow potentials and phasic multiple unit activity --- in central nervous system of sleeping cats
A74-40450
SOIL MECHANICS
Fluorescent antibody detection of microorganisms in terrestrial environments
[NASA-CR-139386] N74-30479
SONAR
A collection of translations of foreign language papers on the subject of biological sonar systems
[AD-778691] N74-29454
SONIC BOOMS
Photographic analysis of human startle reaction to sonic booms
A74-39789
SORBENTS
HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft
[ASME PAPER 74-ENAS-57] A74-39149
SOUND LOCALIZATION
Latency of sound localization as a function of azimuth and frequency
A74-40168
SOUND PRESSURE
Loudness discomfort level under earphone and in the free field - The effects of calibration methods
A74-38856
Photographic analysis of human startle reaction to sonic booms
A74-39789
SPACE ENVIRONMENT SIMULATION
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139
SPACE EXPLORATION
Biologist's questions to space
[BLL-M-23267-(5828.4F)] N74-30459
SPACE FLIGHT FEEDING
Skylab food system laboratory support
[NASA-CR-134380] N74-30490
Space shuttle/food system study. Volume 2, Appendix A: Active heating system-screening analysis. Appendix B: Reconstituted food heating techniques analysis
[NASA-CR-134375] N74-30492
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis
[NASA-CR-134376] N74-30493
Space shuttle/food system study. Volume 2, Appendix F: Flight food and primary packaging
[NASA-CR-134378] N74-30494
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis
[NASA-CR-134379] N74-30495
SPACE PERCEPTION
Sensitization by annular surrounds - Sensitization and the contrast-flash effect
A74-38081
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change
A74-38086
Direction perception and human fixation eye movements
A74-38087
Proximal velocity change as a determinant of space perception
A74-40130
Detectability of relative motion as a function of exposure duration, angular separation, and background
A74-40169
SPACE SHUTTLE ORBITERS
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139
Silver ion bactericide system --- for Space Shuttle Orbiter potable water
[ASME PAPER 74-ENAS-49] A74-39142
SPACE SHUTTLES
Space Shuttle heat pipe thermal control systems design and test
[ASME PAPER 74-ENAS-38] A74-39135
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft
[ASME PAPER 74-ENAS-57] A74-39149
Space shuttle/food system study. Volume 2, Appendix A: Active heating system-screening analysis. Appendix B: Reconstituted food heating techniques analysis
[NASA-CR-134375] N74-30492
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis
[NASA-CR-134376] N74-30493

Space shuttle/food system study. Volume 2, Appendix F: Flight food and primary packaging [NASA-CR-134378] N74-30494
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis [NASA-CR-134379] N74-30495

SPACE STATIONS
Space station prototype Sabatier reactor design verification testing [ASME PAPER 74-ENAS-58] A74-39150

SPACE STORAGE
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis [NASA-CR-134376] N74-30493

SPACE TOOLS
Telemanipulators - A facility for conquering space by man A74-40117

SPACECRAFT CABIN ATMOSPHERES
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation [ASME PAPER 74-ENAS-9] A74-39117
Pulse-modulated dual-gas control subsystem for space cabin atmosphere [ASME PAPER 74-ENAS-13] A74-39119
Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application [ASME PAPER 74-ENAS-16] A74-39120
Development of a prototype module for a non-cryogenic N2/O2 supply system [ASME PAPER 74-ENAS-21] A74-39124
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator [ASME PAPER 74-ENAS-53] A74-39146
Bosch CO2 reduction unit power studies [ASME PAPER 74-ENAS-55] A74-39148

SPACECRAFT COMPONENTS
G189A analytical simulation of the BITE Integrated Waste Management-Water System [ASME PAPER 74-ENAS-8] A74-39116
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis [NASA-CR-134379] N74-30495

SPACECRAFT CONFIGURATIONS
A study of psychrophilic organisms isolated from the manufacture and assembly areas of spacecraft to be used in the Viking mission [NASA-CR-139390] N74-30477

SPACECRAFT ELECTRONIC EQUIPMENT
Life support subsystem monitoring instrumentation [ASME PAPER 74-ENAS-25] A74-39128
Heat pipe thermal conditioning panel [ASME PAPER 74-ENAS-37] A74-39134

SPACECRAFT ENVIRONMENTS
Integrated water and waste management system for future spacecraft [ASME PAPER 74-ENAS-10] A74-39118
The Representative Shuttle Environmental Control System [ASME PAPER 74-ENAS-52] A74-39145

SPACECRAFT INSTRUMENTS
Development of a filter regeneration system for advanced spacecraft fluid systems [ASME PAPER 74-ENAS-18] A74-39122

SPACECRAFT MODULES
Development of a prototype module for a non-cryogenic N2/O2 supply system [ASME PAPER 74-ENAS-21] A74-39124

SPACECRAFT RADIATORS
Space Shuttle heat pipe thermal control systems design and test [ASME PAPER 74-ENAS-38] A74-39135
Shuttle active thermal control system development testing [ASME PAPER 74-ENAS-43] A74-39139

SPACECRAFT STERILIZATION
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components [NASA-CR-139895] N74-29446
A study of psychrophilic organisms isolated from the manufacture and assembly areas of spacecraft to be used in the Viking mission [NASA-CR-139390] N74-30477

SPACECREWS
Design, fabrication and acceptance testing of a zero gravity whole body shower [ASME PAPER 74-ENAS-51] A74-39144
Apollo space crew cardiovascular evaluations A74-39790

SPATIAL FILTERING
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change A74-38086

SPECTRUM ANALYSIS
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles A74-38394

SPINAL CORD
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord A74-38344
Tactile movement detection and discrimination following dorsal column lesions in monkeys A74-39251

SPINE
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine A74-38290
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats A74-40281

STABILIZATION
Adaptation as a factor modifying the stability of enzymes [NASA-TT-F-15505] N74-30474

STATISTICAL ANALYSIS
Epidemiology of coronary heart disease among young Army males of World War II A74-38123
Comments on estimations and tests of EEG amplitude distributions A74-40449

STEREOSCOPIC VISION
Induced stereomovement --- visual perception of rotationally distorted shapes A74-38080
Temporal tolerance of the foveal size of Panum's area A74-38082
On interocular transfer of various visual aftereffects in normal and stereoblind observers A74-38089

STRAIN GAGES
Measurement of the motor activity of test animals A74-38285

STRESS (PHYSIOLOGY)
Evaluation of isoproterenol as a method of stress testing A74-38121
Action of low frequency vibrations on cardiac quickness and variability A74-38503
Cardiac mechanics: Physiological, clinical, and mathematical considerations --- Book A74-39626
Basic terminology and formulae for left ventricular wall stress A74-39627
Force-velocity studies in isolated and intact heart muscle A74-39630
Myocardial energetics --- minute oxygen consumption A74-39631
Review of various theories for the evaluation of left ventricular wall stresses A74-39639
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/ A74-39795
Stability of the intracranial circulation in an altered gravitational field A74-39796
Glucose tolerance tests in rats exposed to varying altitude stress A74-39799
Symposium on Heat Stress and Heat Acclimatization [AD-777700] N74-29449

Physiological responses in air traffic control personnel: Houston Intercontinental Tower --- adapation to stress
[AD-777838] N74-29465

STRESS (PSYCHOLOGY)
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472
Comparison of performance with headphone and free-field noise
A74-40170
The determination of stress and fatigue, taking into account the example of air traffic controllers
A74-40334

STRESS-STRAIN-TIME RELATIONS
Rheological modeling of the intact left ventricle
A74-39641

SUBMERGING
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501

SULFUR OXIDES
Health consequences of sulfur oxides: A report from CHESS, 1970-1971
[EPA-650/1-74-004] N74-29444

SURFACE ROUGHNESS
Control algorithm of the walker climbing over obstacles
A74-39521

SURFACE VEHICLES
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118

SURVIVAL EQUIPMENT
USAF School of Aerospace Medicine survival training
A74-40621

SYMPATHETIC NERVOUS SYSTEM
Behavioral and neurochemical alterations induced by hypoxia in rats
A74-39374

SYSTEMS ANALYSIS
Space shuttle/food system study. Volume 2, Appendix A: Active heating system-screening analysis. Appendix B: Reconstituted food heating techniques analysis
[NASA-CR-134375] N74-30492
Space shuttle/food system. Volume 2, Appendix C: Food cooling techniques analysis. Appendix D: Package and stowage: Alternate concepts analysis
[NASA-CR-134376] N74-30493
Space shuttle/food system study. Volume 2, Appendix F: Flight food and primary packaging
[NASA-CR-134378] N74-30494
Space shuttle/food system study. Volume 2, Appendix G: Ground support system analysis. Appendix H: Galley functional details analysis
[NASA-CR-134379] N74-30495

SYSTEMS ENGINEERING
Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design
A74-38527
The right robot for the right job
A74-40115

SYSTOLE
Systolic time intervals in the noninvasive assessment of left ventricular performance in man
A74-39635

SYSTOLIC PRESSURE
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463

T

TACTILE DISCRIMINATION
Tactile movement detection and discrimination following dorsal column lesions in monkeys
A74-39251
Precise insert operation by tactile controlled robot
A74-40116
Can attention be allocated to sensory modalities --- simultaneous visual, auditory and tactile information processing
A74-40129

TARGET RECOGNITION
A collection of translations of foreign language papers on the subject of biological sonar systems
[AD-778691] N74-29454
Summary of the Human Engineering Laboratory's air-to-ground target detection studies using stationary targets
[AD-779409] N74-29469

TASK COMPLEXITY
The effect of a visual indicator on rate of visual search Evidence for processing control
A74-40132

TAXONOMY
Comments on papers by Reichert and Wong --- information theory for molecular taxonomy
A74-39247

TECHNOLOGY ASSESSMENT
Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings
A74-40114

TECHNOLOGY UTILIZATION
Biology and remote sensing from spacecraft
A74-39277
The right robot for the right job
A74-40115
How space medicine helps terrestrial
[BLL-M-23364-(5828.4F)] N74-30456

TELEOPERATORS
The multi-moded remote manipulator system
A74-39510
Telemanipulators - A facility for conquering space by man
A74-40117
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118

TELEVISION SYSTEMS
Telemanipulators - A facility for conquering space by man
A74-40117

TEMPERATURE CONTROL
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134
Space Shuttle heat pipe thermal control systems design and test
[ASME PAPER 74-ENAS-38] A74-39135
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761

TENSOMETERS
Measurement of the motor activity of test animals
A74-38285

THEMIS PROJECT
Performance, recovery and man-machine effectiveness
[AD-777797] N74-29466

THERMAL CONTROL COATINGS
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136

THERMAL ENERGY
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116

THERMAL SIMULATION
A model of heat transfer in immersed man
A74-38911

THERMODYNAMIC EFFICIENCY
Bosch CO2 reduction unit power studies
[ASME PAPER 74-ENAS-55] A74-39148

THERMODYNAMIC PROPERTIES
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500

THERMOREGULATION
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501

The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904
Correlation of hippocampal theta rhythm with changes in cutaneous temperature --- evoked neuron response in thermoregulation
[NASA-CR-139527] N74-30461
THRESHOLDS (PERCEPTION)
Induced stereomovement --- visual perception of rotationally distorted shapes
A74-38880
Sensitization by annular surrounds - Sensitization and the contrast-flash effect
A74-38881
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity
A74-38888
The spatial selectivity of the tilt aftereffect --- retinal adaptation to gratings
A74-38890
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation
A74-38857
The effect of masker duration on forward and backward masking
A74-40126
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134
Detectability of relative motion as a function of exposure duration, angular separation, and background
A74-40169
TIME DEPENDENCE
The effect of masker duration on forward and backward masking
A74-40126
Fragmentation and identifiability of repeatedly presented brief visual stimuli
A74-40131
TIME DISCRIMINATION
Judgments about the duration of brief stimuli --- in visual discrimination
A74-40127
Effect of hypokinesis and enforced posture on human perception of time
A74-40797
TIME LAG
Temporal tolerance of the foveal size of Panum's area
A74-38082
TIME RESPONSE
Systolic time intervals in the noninvasive assessment of left ventricular performance in man
A74-39635
The effect of a visual indicator on rate of visual search Evidence for processing control
A74-40132
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking
A74-40166
Latency of sound localization as a function of azimuth and frequency
A74-40168
TIME SERIES ANALYSIS
Modeling of human operator performance utilizing time series analysis
A74-40022
TISSUES (BIOLOGY)
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451
TOLERANCES (PHYSIOLOGY)
Symposium on Heat Stress and Heat Acclimatization
[AD-777700] N74-29449
TOXIC HAZARDS
Health consequences of sulfur oxides: A report from CHESS, 1970-1971
[EPA-650/1-74-004] N74-29444
Oxygen toxicity
[AD-779282] N74-29453
TOXICITY
Modern views on oxygen toxicity
A74-40442
TOXICITY AND SAFETY HAZARD
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893
TOXICOLOGY
Toxicology of polymeric materials exposed to heat and fires
A74-38894
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286
TRACERS
Two-tracer method for rapid determination of residual volume --- of lungs
A74-40764
TRAINING SIMULATORS
USAF School of Aerospace Medicine survival training
A74-40621
TRANSFER FUNCTIONS
Transformation function of the external ear in response to impulsive stimulation
A74-38858
A transfer function approach to human operator skill development
A74-39505
Modeling of human operator performance utilizing time series analysis
A74-40022
TRANSLATIONAL MOTION
Proximal velocity change as a determinant of space perception
A74-40130
TRANSPIRATION
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445
TRANSPORT AIRCRAFT
New concepts of medical facilities aboard large-capacity aircraft
A74-38506
TUBERCULOSIS
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502

U

ULTRASONIC TESTS
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
ULTRAVIOLET RADIATION
Study of antinuclear antibodies in subjects with photodermatitis --- antibody response to nucleic acids irradiated with ultraviolet radiation
[NASA-TT-F-15844] N74-30466
UNDERWATER BREATHING APPARATUS
Breathing mixtures --- for underwater diving apparatus
[AD-779302] N74-29456
URINALYSIS
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440

V

VALSALVA EXERCISE
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474
VASOCONSTRICTOR DRUGS
Hypoxic pulmonary vasoconstriction in the rat - The necessary role of angiotensin II
A74-40681

VASODILATION
Challenges to the adenosine hypothesis for the regulation of coronary blood flow A74-38233
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation A74-38234
VECTORCARDIOGRAPHY
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram A74-39793
VEINS
Intrathoracic and venous pressure relationships during responses to changes in body position A74-40755
VELOCITY DISTRIBUTION
Force-velocity studies in isolated and intact heart muscle A74-39630
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity' --- in myocardial muscle function A74-39636
Proximal velocity change as a determinant of space perception A74-40130
VENTILATION FANS
Fan source noise control in environmental systems [ASME PAPER 74-ENAS-45] A74-39140
VERTEBRAE
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats A74-40281
VERTEBRATES
Remote sensing of Antarctic biological resources - Vertebrates A74-39279
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness [NASA-TT-F-15574] N74-30467
VIBRATION DAMPING
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination A74-38083
VIBRATION TESTS
Action of low frequency vibrations on cardiac quickness and variability A74-38503
VIRUSES
Outline of experimental aeromicrobiology --- Russian book A74-38048
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice A74-39794
VISCOUS FLUIDS
Plane oscillatory flow past rectangular obstacles A74-38263
VISORS
Evaluation of Air Force laser protective devices --- eye protection [AD-779522] N74-29468
VISUAL ACUITY
On interocular transfer of various visual aftereffects in normal and stereoblind observers A74-38089
Visual range of an object in the atmosphere [BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
VISUAL CONTROL
Control by generalized visual images A74-39469
The effect of a visual indicator on rate of visual search Evidence for processing control A74-40132
VISUAL DISCRIMINATION
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity A74-38088
Judgments about the duration of brief stimuli --- in visual discrimination A74-40127
Proximal velocity change as a determinant of space perception A74-40130
VISUAL FIELDS
Sensitization by annular surrounds - Sensitization and the contrast-flash effect A74-38081
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change A74-38086
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking A74-40166
VISUAL OBSERVATION
The spatial selectivity of the tilt aftereffect --- retinal adaptation to gratings A74-38090
VISUAL PERCEPTION
Spectral sensitivity of the modulation-sensitive mechanism of vision A74-38084
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew A74-38505
Electrophysiological evidence for colour channels in human pattern vision A74-38646
Can attention be allocated to sensory modalities --- simultaneous visual, auditory and tactile information processing A74-40129
Fragmentation and identifiability of repeatedly presented brief visual stimuli A74-40131
Memory for random shapes - A dual-task analysis --- in visual data processing A74-40165
Characteristics of the average human Visual Evoked Response (VER) [AD-779079] N74-30484
Visual range of an object in the atmosphere [BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
VISUAL PIGMENTS
Light-dependent phosphorylation of rhodopsin in living frogs A74-40422
VISUAL STIMULI
Induced stereomovement --- visual perception of rotationally distorted shapes A74-38080
Sensitization by annular surrounds - Sensitization and the contrast-flash effect A74-38081
Temporal tolerance of the foveal size of Panum's area A74-38082
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change A74-38086
Direction perception and human fixation eye movements A74-38087
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves --- Threshold vs Intensity A74-38088
Repetition effects in choice reaction time to multidimensional stimuli --- sequential visual discrimination A74-40128
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking A74-40166
Characteristics of the average human Visual Evoked Response (VER) [AD-779079] N74-30484
VISUAL TASKS
The effect of a visual indicator on rate of visual search Evidence for processing control A74-40132
Memory for random shapes - A dual-task analysis --- in visual data processing A74-40165
Comparison of performance with headphone and free-field noise A74-40170

VOLUME
Two-tracer method for rapid determination of residual volume --- of lungs
A74-40764

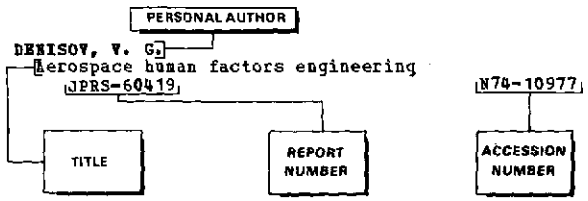
W

WALKING MACHINES
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465
Simulation by digital computer of walking machine control system
A74-39507
Control of a multi-legged vehicle
A74-39509
Control algorithm of the walker climbing over obstacles
A74-39521
A theoretical study of gaits for legged locomotion systems
N74-30455
WASTE DISPOSAL
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118
WASTE UTILIZATION
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141
WATER
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115
WATER BALANCE
Volume conditioned stimuli affecting salt and water excretion --- measurement of plasma volume and central venous pressure
[AD-779781] N74-29457
WATER DEPRIVATION
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen
A74-38915
WATER FLOW
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141
Continuous recording of multiple parameters during perfusion of human colon
A74-40758
WATER MANAGEMENT
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118
WATER RECLAMATION
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141
WATER TREATMENT
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147
WEIGHTLESSNESS
Design, fabrication and acceptance testing of a zero gravity whole body shower
[ASME PAPER 74-ENAS-51] A74-39144
Life in weightlessness biological laboratories in orbit --- using Cosmos 605
[NASA-TT-F-15851] N74-29447
Role of gravity in preparative electrophoresis
N74-29914
Gravitational biology
[BLL-M-23358-(5828.4F)] N74-30457
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness
[NASA-TT-F-15574] N74-30467
Research on the properties of circadian systems amenable to study in space --- using pocket mice in Skylab experiment S-071 for the study of the effects of prolonged weightlessness
[NASA-CR-137523] N74-30489
Automated potentiometric electrolyte analysis system --- for use in weightlessness
[NASA-CR-134373] N74-30491
WETLANDS
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814
WILDLIFE
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis --- Montana
[PAPER-E11] N74-30813
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814

Personal Author Index

AEROSPACE MEDICINE AND BIOLOGY / *A Continuing Bibliography (Suppl. 134)* NOVEMBER 1974

Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

A

ABBOUD, F. M.
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375

ABE, H.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125

ABELSON, L. C.
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800

ABOIMOVA, V. M.
The development of myopia in persons working with computer equipment
A74-40800

ADAMS, D. O.
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-776736] N74-29455

ADAMS, J. F.
Symposium on Heat Stress and Heat Acclimatization
[AD-777700] N74-29449

ADEY, W. R.
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394

ADORISIO, E.
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438

AIGNER, A.
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469

AKSENOVA, E. I.
Assessing the abundance and biomass of phytoplankton by means of electronic computers
[BLL-RTS-8914] N74-30454

ALARIO, J.
Space Shuttle heat pipe thermal control systems design and test
[ASME PAPER 74-ENAS-38] A74-39135

ALDERMAN, E. L.
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474

ALEXANDER, K. R.
Sensitization by annular surrounds - Sensitization and the contrast-flash effect
A74-38081

ALLAN, L. G.
Judgments about the duration of brief stimuli
A74-40127

ALLEN, E. T.
Silver ion bactericide system
[ASME PAPER 74-ENAS-49] A74-39142

ALLEN, R. E.
Preparative electrophoresis of living lymphocytes
N74-29915

ALPERT, N. R.
Mechanical and biochemical correlates of cardiac hypertrophy
A74-40685

AMARAL, L.
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893

AMBLER, B. A.
Hue discrimination in peripheral vision under conditions of dark and light adaptation
A74-40134

AMENDE, I.
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462

ANDERSON, A. J.
Coronary artery occlusion and blood lipids
A74-38122

ANDERSON, I. H.
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285

ANDERSON, R. W., JR.
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470

ANGIBOUST, R.
Reflections on the psychological selection of military aviation aircrew
A74-38504

ANNAU, Z.
Behavioral and neurochemical alterations induced by hypoxia in rats
A74-39374

ARNAULD, E.
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600

ASMUSSEN, E.
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468

AUFFRET, R.
Action of low frequency vibrations on cardiac quickness and variability
A74-38503

AUTIAN, J.
Toxicology of polymeric materials exposed to heat and fires
A74-38894

AVASTHEY, P.
Intrathoracic and venous pressure relationships during responses to changes in body position
A74-40755

AYLWARD, J. R.
Electrokinetic effects in electrochemical cells Hydrogen depolarized CO2 concentrator
[ASME PAPER 74-ENAS-53] A74-39146

B

BAGROVA, N. D.
Effect of hypokinesis and enforced posture on human perception of time
A74-40797

BAILEY, J. P.
Photographic analysis of human startle reaction to sonic booms
A74-39789

BAISSUS, C.
Intraventricular conduction defects in acute myocardial infarction
A74-40473

BAKER, L.
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model
A74-40766

BANNEROT, R. B.
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500

BARANOVA, V. P.
The significance of cumulative coriolis acceleration for tests for expert medical selection
[NASA-TT-F-15824] N74-29448

BARBEAU, A.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684

BARBORIAK, J. J.
Coronary artery occlusion and blood lipids
A74-38122

BARRY, W. E.
The deadly triad
A74-40278

BARTUS, R. T.
Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486

BECK, E. J.
Firefighter's compressed air breathing system pressure vessel development program
[NASA-CR-134384] N74-30497

BEHREND, A. F., JR.
Development of a filter regeneration system for advanced spacecraft fluid systems
[ASME PAPER 74-ENAS-18] A74-39122

BENSON, C. R.
The right robot for the right job
A74-40115

BEPPU, S.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125

BERGER, A. E.
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451

BERKHOUT, J.
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394

BERKOV, S.
Hypoxic pulmonary vasoconstriction in the rat - The necessary role of angiotensin II
A74-40681

BERNE, R. M.
Challenges to the adenosine hypothesis for the regulation of coronary blood flow
A74-38233
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides
A74-40682

BIER, M.
Role of gravity in preparative electrophoresis
N74-29914

BIGAZZI, P. E.
Preparative electrophoresis of living lymphocytes
N74-29915

BINDER, M. J.
Role of gravity in preparative electrophoresis
N74-29914

BIRD, T. J.
Circadian variation in presumably heathly young soldiers
[NASA-CR-139234] N74-29452

BLACKMORE, D. J.
Aircraft accident toxicology - U.K. experience 1967-1972
A74-40286

BLAKE, R.
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change
A74-38086

BLOOR, C. M.
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232

BLUMENTHAL, A. H.
Evaluation of Air Force laser protective devices
[AD-779522] N74-29468
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470

BLUNDO, G.
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440

BOLZANO, K.
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469

BOND, C. R., JR.
Air crew - Avionics system interface through an interactive controller lends a new flexibility in system operational design
A74-38527

BORNSTEIN, M. H.
Spectral sensitivity of the modulation-sensitive mechanism of vision
A74-38084

BOUCHER, R.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684

BOURDEAU-MARTINI, J.
Role of O2 in control of the coronary capillary reserve
A74-38235
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686

BOUTELIER, C.
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501

BRADFORD, J. M., JR.
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753

BRADINOV, B. N.
Control by generalized visual images
A74-39469

BRAUNOHLER, W. M.
Deaths from burns in Army aircraft, 1965-1971
A74-40280

BREWER, R. L.
Circadian variation in presumably heathly young soldiers
[NASA-CR-139234] N74-29452

BROCHET, P.
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445

BROCK, T. E.
Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings
A74-40114

BROOKER, J. Z.
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474

BROSE, H. F.
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145

BRU, R.
Visual elements of the ergonomic evaluation of a new integrated instrument panel
A74-38510

BUCKBERG, G. D.
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236

BURK, R. F.
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/
A74-39795

BURNAZYAN, A.
Biologist's questions to space
[BIL-M-23267-(5828.4F)] N74-30459

BURTON, R. R.
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765

BUTIN, R. L.
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137

BYNUM, J. A.
An experimental investigation of the role of motion in ground-based trainers
[AD-778665] N74-29471

C

CADOTTE, J. E.
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114

CAMPBELL, J. E.
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components
[NASA-CR-138895] N74-29446
Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components
[NASA-CR-139485] N74-30480

CAMPORESI, E. M.
Two-tracer method for rapid determination of residual volume
A74-40764

CARPENTER, A.
Comparison of performance with headphone and free-field noise
A74-40170

CHATRIAN, G. E.
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448

CHATTERJEE, K.
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638

CHAUVE, A.
Continuous recording of multiple parameters during perfusion of human colon
A74-40758

CHAVCHANIDZE, V. V.
Mathematical model of behavior developed on the basis of the theory of set
[AD-776128] N74-29450

CHEITLIN, M. D.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120

CHEN, C. K.
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500

CHENG, L.-C.
Plane oscillatory flow past rectangular obstacles
A74-38263

CHEVALERAUD, J.-P.
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505

CHOBANIAN, A. V.
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793

CHRISTENSEN, E. H.
Mean lung capacity under increased O2 demand
[NASA-TT-F-15598] N74-30468

CIMENT, M.
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451

CINKOTAI, F. F.
Fluid flow in a model alveolar sac
A74-40760

CLARK, M. E.
Plane oscillatory flow past rectangular obstacles
A74-38263

CLONTS, S. E.
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116

COBIAN, K. E.
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114

COGGI, J. V.
G189A analytical simulation of the RITE Integrated Waste Management-Water System
[ASME PAPER 74-ENAS-8] A74-39116

COLIN, J.
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501

COMBS, D. T.
Evaluation of isoproterenol as a method of stress testing
A74-38121

CONSOLAZIO, C. F.
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/
A74-39795

COSTILL, D. L.
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759

COX, J. E.
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500

COXON, M.
Role of gravity in preparative electrophoresis
N74-29914

CRAIGHEAD, J. J.
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis
[PAPER-E11] N74-30813

CUCHE, J.-L.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684

CUDAHY, E.
The effect of masker duration on forward and backward masking
A74-40126

CUDNY, B.
Measurement of the motor activity of test animals
A74-38285

CORNISH, R. R.
Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides
A74-40682

CUSICK, R. J.
Space station prototype Sabatier reactor design verification testing
[ASME PAPER 74-ENAS-58] A74-39150

D

DALLY, L. J.
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761

DANIELS, D. J.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136

DARIAN-SMITH, I.
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761

DAROFF, R. B.
Functional organization of the ocular motor system
A74-39798

DAS, H. K.
Glucose tolerance tests in rats exposed to varying altitude stress
A74-39799

DAVIA, J. E.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120

DAVIS, J. A.
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753

DAVIS, R. J.
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472

DAWS, T. A.
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 m/
A74-39795

DE GIROLAMO, A.
Observations of the embryonal rat pancreas during chronic hypoxia
A74-40439

DE WEERT, CH. M. M.
Binocular brightness combinations - Additive and nonadditive aspects
A74-40133

DE, S. K.
Toxicology of polymeric materials exposed to heat and fires
A74-38894

DELLOSSO, L. F.
Functional organization of the ocular motor system
A74-39798

DEMANGE, J.
Action of low frequency vibrations on cardiac quickness and variability
A74-38503

DESCAMP, V. A.
Development of a filter regeneration system for advanced spacecraft fluid systems
[ASME PAPER 74-ENAS-18] A74-39122

DEVROEDE, G.
Continuous recording of multiple parameters during perfusion of human colon
A74-40758

DI BIASE, M.
Intraventricular conduction defects in acute myocardial infarction
A74-40473

DIAMOND, G.
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638

DIERCKS, K. J.
A collection of translations of foreign language papers on the subject of biological sonar systems
[AD-778691] N74-29454

DIETZ, J. B.
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139

DILL, D. B.
Calculation of percentage changes in volumes of blood, plasma, and red cells in dehydration
A74-40759

DIRKS, D. D.
Loudness discomfort level under earphone and in the free field - The effects of calibration methods
A74-38856

DODGE, H. T.
Angiocardiographic methods for determination of left ventricular geometry and volume
A74-39632
Clinical applications of angiocardiography
A74-39633

DONOVAN, M. B.
Thermal analysis of the Skylab airlock module
[ASME PAPER 74-ENAS-40] A74-39137

DOWLER, W. L.
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141

DREIFUSS, J. J.
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600

DRESEL, P. E.
Conduction defects in experimental atrial arrhythmia
A74-38124
Relationship of the functional refractory period to conduction in the atrioventricular node
A74-40679

DROGE, K. H.
Telemanipulators - A facility for conquering space by man
A74-40117

DUBININ, N.
Gravitational biology
[BLL-M-23358-(5828.4F)] N74-30457

DUDEK, R. A.
Performance, recovery and man-machine effectiveness
[AD-777797] N74-29466

DUDNIKOV, V. V.
Certain methodological approaches to studying pilot activity errors
A74-40798

E

ECHALLIER, J. F.
Coronal topography of human auditory evoked responses
A74-40447

EL-SAYED, S. Z.
Use of remote sensing in the study of Antarctic marine resources
A74-39278

ELLISON, R. C.
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity'
A74-39636

ERWIN, D. E.
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking
A74-40166

F

FALSETTI, H.
A model of cardiac muscle dynamics
A74-40678

FANHI, L. E.
Effect of anesthesia on rate of N2 washout from body stores
A74-40757

FEGLEY, K. A.
Control of a multi-legged vehicle
A74-39509

FEIGENBAUM, H.
Use of echocardiography to evaluate cardiac performance
A74-39634

FELFOLDY, G. L.
Repetition effects in choice reaction time to multidimensional stimuli
A74-40128

FERRIER, G. R.
Relationship of the functional refractory period to conduction in the atrioventricular node
A74-40679

FERRIS, S. H.
Effects of repetition and dark adaptation on visual evoked responses in the rat
[AD-780060] N74-30486
FINDLAY, J. M.
Direction perception and human fixation eye movements
A74-38087
FINKE, H.-O.
Effects of aircraft noise on man
A74-40091
FINLAY, G. D.
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753
FIXLER, D. E.
Extent of myocardial flow from luminal collateral circulation
A74-40763
FLAMENG, W.
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
FLEMING, M. L.
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139
FLEMMA, R. J.
Coronary artery occlusion and blood lipids
A74-38122
FLYNN, E. T., JR.
Two-tracer method for rapid determination of residual volume
A74-40764
FOOTE, W.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
FORISTER, T. C.
USAF School of Aerospace Medicine survival training
A74-40621
FORMAN, B. H.
Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat
A74-40680
FORRESTER, J. S.
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
FOSTER, T. L.
A study of psychrophilic organisms isolated from the manufacture and assembly areas of spacecraft to be used in the Viking mission
[NASA-CR-139390] N74-30477
FOX, R.
Binocular rivalry suppression - Insensitive to spatial frequency and orientation change
A74-38086
FRANKLIN, D.
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
FRANKS, W. R.
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
FREEDMAN, S.
Pressures developed by loaded inspiratory muscles in conscious and anesthetized man
A74-40756
FRINKING, H. D.
Biology and remote sensing from spacecraft
A74-39277
FROLOV, K. V.
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account
N74-29799
FROST, J. D., JR.
Fabrication of neurophysiological monitoring systems
[NASA-CR-2416] N74-29461

G

GABE, I. T.
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463
GATCHEL, R. J.
Frequency of feedback and learned heart rate control
A74-40167
GATLIN, L. L.
Conservation of Shannon's redundancy for proteins
A74-39244
Comments on papers by Reichert and Wong
A74-39247
GAUER, O. H.
Volume conditioned stimuli affecting salt and water excretion
[AD-779781] N74-29457
GAZZI, M.
Visual range of an object in the atmosphere
[BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
GENEST, J.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
GEORGE, C. E.
Performance, recovery and man-machine effectiveness
[AD-777797] N74-29466
GERBIER, M.
Evapotranspiration: Agrometeorological aspect. Practical evaluation of evapotranspiration potential
N74-29445
GHISTA, D. N.
Cardiac mechanics: Physiological, clinical, and mathematical considerations
A74-39626
Rheological modeling of the intact left ventricle
A74-39641
Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations
A74-39642
GHOSH, N. C.
Glucose tolerance tests in rats exposed to varying altitude stress
A74-39799
GILLMAN, C. P.
Preparative electrophoresis of living lymphocytes
N74-29915
GILLMORE, J. D.
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice
A74-39794
GILMER, D. S.
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814
GIROD, J.
Coronal topography of human auditory evoked responses
A74-40447
GLUKHAREV, K. K.
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account
N74-29799
GOLDNER, A. S.
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800
GORDON, P. B.
Parabarosis and experimental infection. V - Effect of altered oxygen tension on Coxsackie B-1 infection in adult mice
A74-39794
GOTO, T.
Precise insert operation by tactile controlled robot
A74-40116
GRABOYS, T. B.
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793

GRANT, B. J. B.
Sequence of regional filling during a tidal breath in man
A74-40754

GRANTHAM, D. W.
Can attention be allocated to sensory modalities
A74-40129

GREEN, K. A.
Use of remote sensing in the study of Antarctic marine resources
A74-39278

GREENLEAF, J. F.
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

GREENOUGH, B. M.
Development of a prototype module for a non-cryogenic N2/O2 supply system
[ASME PAPER 74-ENAS-21] A74-39124

GREENWOOD, F. M.
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145

GREGORATOS, G.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120

GROOD, E. S.
A model of cardiac muscle dynamics
A74-40678

GROOM, B. C.
Effect of anesthesia on rate of N2 washout from body stores
A74-40757

GRUNDITZ, D. W.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136

GUINN, N.
Feasibility of using special measures in the classification and assignment of lower mental ability airmen
[AD-777831] N74-29467

GUROVSKY, N.
How space medicine helps terrestrial
[BLL-M-23364-(5828.4F)] N74-30456

GUSKI, R.
Effects of aircraft noise on man
A74-40091

GUTAUSKAS, A. I.
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345

H

HADNI, J.-C.
The doctor-pilot relationship
A74-38508

HAJDU, L.
Characteristic biological sensors
A74-39414

HALBERG, F.
Circadian variation in presumably healthy young soldiers
[NASA-CR-139234] N74-29452

HALLAL, F. J.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120

HALLICK, T. M.
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498

HALPERN, W.
Mechanical and biochemical correlates of cardiac hypertrophy
A74-40685

HAMILTON, R. W., JR.
Oxygen toxicity
[AD-779282] N74-29453
Breathing mixtures
[AD-779302] N74-29456

HAMRELL, B. B.
Mechanical and biochemical correlates of cardiac hypertrophy
A74-40685

HARADA, Y.
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904

HARRIS, N. S.
Plasma cell surface antigen on human blood lymphocytes
A74-39380

HARRIS, W. S.
Systolic time intervals in the noninvasive assessment of left ventricular performance in man
A74-39635

HARRISON, D. C.
Alterations in left ventricular volumes induced by Valsalva manoeuvre
A74-40474

HARTLEY, L. R.
Comparison of performance with headphone and free-field noise
A74-40170

HARVEY, L. O., JR.
Detectability of relative motion as a function of exposure duration, angular separation, and background
A74-40169

HAYDEN, P.
Research on the properties of circadian systems amenable to study in space
[NASA-CR-137523] N74-30489

HEISTAD, D. D.
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375

HENNIG, J.
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083

HERMAN, G. T.
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

HERMANSEN, L.
Oxygen transport during exercise in human subjects
A74-38851

HERSHENSON, M.
Functional characteristics of visual persistence predicted by a two-factor theory of backward masking
A74-40166

HILDEB, R.
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761

HINCKLEY, J. O. N.
Role of gravity in preparative electrophoresis
N74-29914

HOPPLER, G. W.
Apollo space crew cardiovascular evaluations
A74-39790

HOFFMAN, M.
Physiological responses in air traffic control personnel: Houston Intercontinental Tower
[AD-777838] N74-29465

HOLMES, R. F.
Bosch CO2 reduction unit power studies
[ASME PAPER 74-ENAS-55] A74-39148

HOLMGREN, J. E.
The effect of a visual indicator on rate of visual search Evidence for processing control
A74-40132

HONIG, C. R.
Role of O2 in control of the coronary capillary reserve
A74-38235
Extravascular component of oxygen transport in normal and hypertrophied hearts with special reference to oxygen therapy
A74-40686

HOOD, W. B., JR.
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction
A74-40683

HORI, T.
The effects of ambient and hypothalamic temperatures on the hyperthermic responses to prostaglandins E1 and E2
A74-40904

HOROWITZ, J. M.
Correlation of hippocampal theta rhythm with changes in cutaneous temperature
[NASA-CR-139527] N74-30461
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462

HORVATH, S. M.
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat
A74-39791

HOUCK, O. K.
An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147

HOWELL, H. R.
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139

HRUBEC, Z.
Epidemiology of coronary heart disease among young Army males of World War II
A74-38123

HSIEH, A. C. L.
Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462

HUFFINES, D.
Extent of myocardial flow from luminal collateral circulation
A74-40763

HUGENHOLTZ, P. G.
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity'
A74-39636

HUGHES, J. M. B.
Sequence of regional filling during a tidal breath in man
A74-40754

HUMPHREY, M. P.
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141

I

INGELFINGER, A. L.
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118

INGRAM, R. H., JR.
Relationship of alveolar CO2 and O2 pressures to AaDo2 in normal subjects
A74-40753

INOYAMA, T.
Precise insert operation by tactile controlled robot
A74-40116

IPPOLITO, F.
Study of antinuclear antibodies in subjects with photodermatitis
[NASA-TT-F-15844] N74-30466

IRWIN, D. J.
Characteristics of the average human Visual Evoked Response (VER)
[AD-779079] N74-30484

IVANOV, Y.
Man-operator in space
[NASA-TT-F-15714] N74-30488

IVANOVA, T. I.
Stability of the intracranial circulation in an altered gravitational field
A74-39796

J

JACKSON, J. K.
Pulse-modulated dual-gas control subsystem for space cabin atmosphere
[ASME PAPER 74-ENAS-13] A74-39119

JACOBSON, I. D.
Ride quality evaluation 1: Questionnaire studies of airline passenger comfort
[NASA-CR-139368] N74-29460

JASIONOWSKI, W. J.
Silver ion bactericide system
[ASME PAPER 74-ENAS-49] A74-39142

JENKINS, G. W.
The effect of masker duration on forward and backward masking
A74-40126

JENSEN, F. C.
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498

JOHANNSEN, U. J.
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375

JOHNSON, H. L.
Glucose-C/14/-UL metabolism in man after abrupt altitude exposure /4,300 M/
A74-39795

JOHNSON, J. W.
Symposium on Heat Stress and Heat Acclimatization
[AD-777700] N74-29449

JOHNSON, K. O.
A contact stimulator for the study of cutaneous thermal sensibility
A74-40761

JOHNSON, R. L.
Apollo space crew cardiovascular evaluations
A74-39790

JOHNSON, R. M.
Fragmentation and identifiability of repeatedly presented brief visual stimuli
A74-40131

JOHNSON, S. A.
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

JOHNSTON, R. S.
The Manned Spacecraft Center and medical technology
A74-38703

JONES, H. A.
Sequence of regional filling during a tidal breath in man
A74-40754

JONES, P. K.
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234

K

KAFER, E. R.
Pressures developed by loaded inspiratory muscles in conscious and anesthetized man
A74-40756

KALABUKHOV, N. I.
Periodic (seasonal and yearly) changes in the organism of rats: Their causes and effects
[NASA-TT-F-14101] N74-30463

KAMABROCKI, L. L.
Circadian variation in presumably heathly young soldiers
[NASA-CR-139234] N74-29452

KAPLAN, B. H.
Method of determining spinal alignment and level of probable fracture during static evaluation of ejection seats
A74-40281

KARARA, H. M.
Topography of aortic heart valves
[NASA-CR-139566] N74-30476

KAREN, R. D.
Correlation of hippocampal theta rhythm with changes in cutaneous temperature
[NASA-CR-139527] N74-30461
KARNES, R. N.
A user-oriented program for crash dynamics
A74-39782
KATTUS, A. A., JR.
Factors determining the distribution and adequacy of left ventricular myocardial blood flow
A74-38236
KATZ, A. M.
Biochemical basis for cardiac contraction
A74-39629
KAWANO, P. I.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
KELLY, R. T.
Memory for random shapes - A dual-task analysis
A74-40165
KEMPER, W. S.
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
KEMPTON, A. R.
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
KETTERER, F. D.
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208
KHABIBOV, B.
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
KHACHATURYANTS, L.
Man-operator in space
[NASA-TT-F-15714] N74-30488
KHOMINICH, V. S.
Combined method for studying the quality, 'roughness', and stability of ergatic control systems
A74-40661
KHRUNOV, Y.
Man-operator in space
[NASA-TT-F-15714] N74-30488
KIJEWSKI, S.
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle
A74-40903
KING, H. A.
Improved fireman's compressed air breathing system pressure vessel development program
[NASA-CR-134385] N74-30496
KIRKPATRICK, M.
Manipulator system man-machine interface evaluation program
[NASA-CR-120218] N74-29459
KIRSCH, K.
Volume conditioned stimuli affecting salt and water excretion
[AD-779781] N74-29457
KISLIAKOV, IU. IA.
Stability of the intracranial circulation in an altered gravitational field
A74-39796
KLEINWACHTER, H.
Telemanipulators - A facility for conquering space by man
A74-40117
KLETT, A. T.
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814
KNOX, F. S., III
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279
KO, W. H.
Microelectronic bioinstrumentation system
[NASA-CR-139216] N74-29463
KOOB, G. P.
Behavioral and neurochemical alterations induced by hypoxia in rats
A74-39374
KOPP, C. V., JR.
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114
KOSTELL, G. D.
Life support subsystem monitoring instrumentation
[ASME PAPER 74-ENAS-25] A74-39128
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498
KOTOVSKAIA, A. R.
Predicting resistance to G-forces by the aid of a decompression functional test
[NASA-TT-F-15823] N74-30471
KRASS, P. M.
Seasonal dynamics of the absolute and relative weight of the adrenal glands and of the peripheral blood level of 11-oxycorticosteroids in the red-cheeked Siberian marmot /Citellus erythrogenis br./
A74-40900
KREFFT, S.
Cardiac injuries resulting from ejection
A74-40282
KRISTOFFERSON, A. B.
Judgments about the duration of brief stimuli
A74-40127
KUCHEL, O.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
KUECHLE, V. B.
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
KUEHN, H.
Light-dependent phosphorylation of rhodopsin in living frogs
A74-40422
KUPRIANOV, S. S.
Control by generalized visual images
A74-39469
KUPRIIANOV, A. A.
Certain methodological approaches to studying pilot activity errors
A74-40798
KURTZ, D.
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472

L

LAFONTAINE, E.
New concepts of medical facilities aboard large-capacity aircraft
A74-38506
LAMPERT, E.
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
LANGE, L.
Volume conditioned stimuli affecting salt and water excretion
[AD-779781] N74-29457
LANGLOIS, Y.
Autonomic nervous system and benign essential hypertension in man. I - Usual blood pressure, catecholamines, renin, and their interrelationships. II - Circulatory and hormonal responses to upright posture
A74-40684
LEDLEY, F. D.
Computer analysis of ultrasoundcardiograms
A74-38289
LEE, S. L.
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821

LENDA, J. A.
Design, fabrication and acceptance testing of a zero gravity whole body shower
[ASME PAPER 74-ENAS-51] A74-39144
LEVELT, W. J. M.
Binocular brightness combinations - Additive and nonadditive aspects
A74-40133
LEYTON, R. A.
Cardiac ultrastructure and function in the normal and failing heart
A74-39628
LIANG, C.-S.
The myocardial depressant effect of beta-receptor blocking agents - Comparative study of dl-propranolol, d-propranolol, and practolol in awake dogs with and without acute myocardial infarction
A74-40683
LILLE, R. D.
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793
LINDBERG, R. G.
Research on the properties of circadian systems amenable to study in space
[NASA-CR-137523] N74-30489
LISCH, H. J.
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469
LIU, Y. K.
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290
LOETSCH, B.
Photorespiration and the primary reactions of photosynthesis
[BLL-DRIC-TRANS-3293-(3623.66)] N74-30460
LONSDORFER, J.
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
LOOSE, J. D.
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134
LOVELL, J.
HS-C - A regenerable CO2/H2O sorbent for a shuttle type spacecraft
[ASME PAPER 74-ENAS-57] A74-39149
LOWES, A. L.
An experimental investigation of the role of motion in ground-based trainers
[AD-778665] N74-29471
LUND, D. J.
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-778736] N74-29455

M

MAGLIOZZI, B.
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140
MAHAN, R. E.
Development of a prototype module for a non-cryogenic N2/O2 supply system
[ASME PAPER 74-ENAS-21] A74-39124
MAKSIMOV, V. I.
Adaptation as a factor modifying the stability of enzymes
[NASA-TT-F-15505] N74-30474
MAKSIMOVA, I. A.
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia
A74-38509
MALHOTRA, M. S.
Effect of prolonged stay at altitude /4000 m/ on autonomic balance
A74-39797
MALONE, T. B.
Manipulator system man-machine interface evaluation program
[NASA-CR-120218] N74-29459
MARK, A. L.
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375
MARKS, L. E.
Spectral sensitivity of the modulation-sensitive mechanism of vision
A74-38084
MARSHALL, R. D.
Spacecraft nitrogen resupply technology - Nitrogen/hydrogen separation
[ASME PAPER 74-ENAS-9] A74-39117
MARTIN, C. M.
Evaluation of isoproterenol as a method of stress testing
A74-38121
MARTIN, D. W.
Memory for random shapes - A dual-task analysis
A74-40165
MARTIN, R.
Effects of aircraft noise on man
A74-40091
MARTINEZ, E.
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
MASON, J. K.
Aviation pathology and the group system - A case of breakup in the air
A74-40277
MATES, R. E.
A model of cardiac muscle dynamics
A74-40678
MATHENY, W. G.
An experimental investigation of the role of motion in ground-based trainers
[AD-778665] N74-29471
MATHEW, L.
Effect of prolonged stay at altitude /4000 m/ on autonomic balance
A74-39797
MATSNEV, E. I.
The significance of cumulative coriolis acceleration for tests for expert medical selection
[NASA-TT-F-15824] N74-29448
MATSUMOTO, H.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
MATSUO, H.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
MATTHEWS, R. L.
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448
MCCAHAN, G. R., JR.
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279
MCCARTY, R.
Coronary artery disease in young patients - Arteriographic and clinical review of 40 cases aged 35 and under
A74-38120
MCCOY, K. E.
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134
MCKENZIE, J. M.
Physiological responses in air traffic control personnel: Houston Intercontinental Tower
[AD-777838] N74-29465
MCKEEKIN, R. R.
Deaths from burns in Army aircraft, 1965-1971
A74-40280
Kinematics of aircraft occupants in accidents - Feasibility of computer simulation
A74-40284
MELTON, C. E.
Physiological responses in air traffic control personnel: Houston Intercontinental Tower
[AD-777838] N74-29465

METZGAR, P. B.
Fan source noise control in environmental systems
[ASME PAPER 74-ENAS-45] A74-39140
MEUNIER-CARUS, J.
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
MICHEL, F.
Coronal topography of human auditory evoked responses
A74-40447
MICHELETTI, G.
Respiratory and right heart function in different types of obese patients
[NASA-TT-F-15827] N74-30472
MICHON, J. A.
Detectability of relative motion as a function of exposure duration, angular separation, and background
A74-40169
MIECZKOWSKI, T.
Field of vision and simple reaction time during recreation exercises at work
[NASA-TT-F-15828] N74-29464
MIKULA, J. J.
Evaluation of Air Force laser protective devices
[AD-779522] N74-29468
The use of dynamic filtering as a means of laser eye protection
[AD-779555] N74-29470
MILLS, C. J.
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463
MININ, B. A.
Microwaves and man's safety
A74-38676
MIRSKY, I.
Cardiac mechanics: Physiological, clinical, and mathematical considerations
A74-39626
Basic terminology and formulae for left ventricular wall stress
A74-39627
Force-velocity studies in isolated and intact heart muscle
A74-39630
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity'
A74-39636
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle
A74-39637
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
Review of various theories for the evaluation of left ventricular wall stresses
A74-39639
MITCHELL, D. E.
On interocular transfer of various visual aftereffects in normal and stereoblind observers
A74-38089
The spatial selectivity of the tilt aftereffect
A74-38090
MOIR, T. W.
Observations on the effect of changes in arterial oxygenation on adenosine induced coronary vasodilation
A74-38234
MONTGOMERY, L. D.
A model of heat transfer in immersed man
A74-38911
MONTGOMERY, P. R.
Conduction defects in experimental atrial arrhythmia
A74-38124
MORGAN, D. E.
Loudness discomfort level under earphone and in the free field - The effects of calibration methods
A74-38856
MOROZOVA, N. I.
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account
N74-29799
MORRIS, E. E.
Improved fireman's compressed air breathing system pressure vessel development program
[NASA-CR-134385] N74-30496
MOSHER, R. S.
The right robot for the right job
A74-40115
MOSKALENKO, IU. E.
Stability of the intracranial circulation in an altered gravitational field
A74-39796
MULROW, P. J.
Effect of propranolol on blood pressure and plasma renin activity in the spontaneously hypertensive rat
A74-40680
MUNSON, J. B.
Dissociation of slow potentials and phasic multiple unit activity
A74-40450
MURRAY, R. W.
Integrated water and waste management system for future spacecraft
[ASME PAPER 74-ENAS-10] A74-39118

N

NATALI, P. G.
Study of antinuclear antibodies in subjects with photodermatitis
[NASA-TT-F-15844] N74-30466
NEE, T. W.
Role of gravity in preparative electrophoresis
N74-29914
NEVINS, J. L.
The multi-moded remote manipulator system
A74-39510
NIMURA, Y.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram
A74-38125
NOBILI, G.
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438
NOORDERGRAAF, A.
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208
NORREN, D. V.
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085
NORTH, B. F.
Bosch CO2 reduction unit power studies
[ASME PAPER 74-ENAS-55] A74-39148
NOVICK, A.
Mathematical models and electrophysiological studies of echolocation
[AD-779047] N74-29458
NUNEZ, L. J.
Toxicology of polymeric materials exposed to heat and fires
A74-38894
NUNNELEY, S. A.
Two-tracer method for rapid determination of residual volume
A74-40764
NUTTALL, L. J.
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115

O

ODONNELL, R. D.
Contamination of scalp EEG spectrum during contraction of cranio-facial muscles
A74-38394
OHTA, Y.
Effect of anesthesia on rate of N2 washout from body stores
A74-40757

OKHOTSIMSKII, D. E.
Control algorithm of the walker climbing over obstacles
A74-39521

OLSSON, R. A.
Current topics in coronary research; Proceedings of the Symposium, Washington, D.C., March 29, 30, 1973
A74-38232

OSER, H.
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2
[DLR-FB-74-02] N74-30482

P

PADMOS, P.
Dark adaptation of separate cone systems studied with psychophysics and electroretinography
A74-38085

PALMOWSKI, J.
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237

PANNIER, R.
The treatment of pulmonary tuberculosis and the suitability of aircrew
A74-38502

PAOLUCCI, G.
Determination of the emotional states of student pilots during flight by measuring the vanilmandelic acid /VMA/ excreted with the urine
A74-40440

PARK, W. T.
Control of a multi-legged vehicle
A74-39509

PARMLEY, W. W.
Force-velocity studies in isolated and intact heart muscle
A74-39630
Evaluation of passive elastic stiffness for the left ventricle and isolated heart muscle
A74-39637
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638

PASQUET, J.
New concepts of medical facilities aboard large-capacity aircraft
A74-38506

PASTERNAC, A.
Clinical applications of force-velocity parameters and the concept of a 'normalized velocity'
A74-39636

PATRICK, T. A.
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762

PAVLOV, V. V.
Combined method for studying the quality, 'roughness', and stability of ergatic control systems
A74-40661

PEDGLEY, D. E.
ERTS surveys a 500 km squared locust breeding site in Saudi Arabia
[PAPER-A15] N74-30722

PENHA, P. D.
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893

PENNER, M. J.
The effect of masker duration on forward and backward masking
A74-40126

PERONNET, F.
Coronal topography of human auditory evoked responses
A74-40447

PERSSON, J.
Comments on estimations and tests of EEG amplitude distributions
A74-40449

PETTERMELLA, M.
Simulation by digital computer of walking machine control system
A74-39507

PEVZNER, L. Z.
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots
A74-40899

PIERNICE, D.
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083

PIRUZIAN, L. A.
Free radical condition and the change of electrolyte balance in organs of experimental animals in state of hypo and hyperoxia
A74-38509

PLATONOV, A. K.
Control algorithm of the walker climbing over obstacles
A74-39521

POLANSKY, B. J.
Effects of lower body negative pressure on plasma catecholamine, plasma renin activity and the vectorcardiogram
A74-39793

POLIS, B. D.
Physiological responses in air traffic control personnel: Houston Intercontinental Tower
[AD-777838] N74-29465

POLISTENA, A.
Modern views on oxygen toxicity
A74-40442

POLTINNIKOV, V. I.
Assessing the abundance and biomass of phytoplankton by means of electronic computers
[BLL-RTS-8914] N74-30454

POOL, S. L.
The Manned Spacecraft Center and medical technology
A74-38703

POPMA, D. C.
Environmental control system development for manned spacecraft 1960-1973
[ASME PAPER 74-ENAS-50] A74-39143

POPOV, V.
Man-operator in space
[NASA-TT-F-15714] N74-30488

POTEKHINA, I. L.
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344

POTEMKIN, B. A.
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account
N74-29799

POWELL, J. D.
Life support subsystem monitoring instrumentation
[ASME PAPER 74-ENAS-25] A74-39128

PRESMAN, A. S.
Electromagnetic signaling in animate nature
[JPRS-62434] N74-30478

PRICE, G. R.
Loss and recovery processes operative at the level of the cochlear microphonic during intermittent stimulation
A74-38857
Transformation function of the external ear in response to impulsive stimulation
A74-38858
Upper limit to stapes displacement - Implications for hearing loss
A74-38859

PRITCHARD, P. H.
The degradation of oil in continuous culture
[AD-780234] N74-30485

PROICHEV, T. F.
Control by generalized visual images
A74-39469

PUPATO, A. M.
Control processes in biology and technology
A74-40478

Q

QUATTRONE, P. D.
Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application
[ASME PAPER 74-ENAS-16] A74-39120

R

RABOUTET, J.
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/ A74-38507

RABOUTET, P.
In-flight incapacities suffered by professional pilots in French civil aviation /from 1948 to 1972/ A74-38507

RAHN, H.
Respiratory gas exchange of high altitude adapted chick embryos A74-40765

RAMEY, E.
A contact stimulator for the study of cutaneous thermal sensibility A74-40761

RAYNAUD, G.
Visual elements of the ergonomic evaluation of a new integrated instrument panel A74-38510

READ, D. J. C.
Pressures developed by loaded inspiratory muscles in conscious and anesthetized man A74-40756

RECHMENSKII, S. S.
Outline of experimental aeromicrobiology A74-38048

REED, M. W.
Shuttle active thermal control system development testing
[ASME PAPER 74-ENAS-43] A74-39139

REGAN, D.
Electrophysiological evidence for colour channels in human pattern vision A74-38646

REGAN, T. J.
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog A74-40464

RENO, V. R.
Microwave reflection, diffraction and transmission studies of man
[AD-780226] N74-30501

REPETSKIY, L.
Scientific projects at Pushchino Biological Study Center N74-30846

RHOADES, R. A.
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model A74-40766

Influence of altered gaseous environments on lung metabolism
[AD-779048] N74-30483

RICHARDS, L. G.
Ride quality evaluation 1: Questionnaire studies of airline passenger comfort
[NASA-CR-139368] N74-29460

RIHM, A. A.
Coronary artery occlusion and blood lipids A74-38122

RIZZON, P.
Intraventricular conduction defects in acute myocardial infarction A74-40473

ROBERTSON, J. M.
Plane oscillatory flow past rectangular obstacles A74-38263

RODRIGUEZ, R. J.
Microelectronic bioinstrumentation system
[NASA-CR-139216] N74-29463

ROGERS, J. C. W.
Numerical solution of a diffusion consumption problem with a free boundary
[AD-778309] N74-29451

ROGERS, T. D.
Alterations in cellular and metabolic processes
[NASA-CR-139398] N74-30475

ROHRMANN, B.
Effects of aircraft noise on man A74-40091

ROSEN, P.
Plant adaptation to cold. 1: Chlorophyll. 2: Minerals
[NASA-CR-139528] N74-30481

ROSIN, G. S.
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument) N74-29811

ROTENBERG, S.
Field of vision and simple reaction time during recreation exercises at work
[NASA-TT-F-15828] N74-29464

ROZELLE, L. T.
NS-100 membranes for reverse osmosis applications
[ASME PAPER 74-ENAS-1] A74-39114

RUBIO, R.
Challenges to the adenosine hypothesis for the regulation of coronary blood flow A74-38233

Release of adenosine from ischemic brain - Effect on cerebral vascular resistance and incorporation into cerebral adenine nucleotides A74-40682

RYZHOV, Y. I.
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument) N74-29811

S

SAASKI, E. W.
Heat pipe thermal conditioning panel
[ASME PAPER 74-ENAS-37] A74-39134

SAILER, S.
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469

SAKAKIBARA, H.
Noninvasive preoperative diagnosis of cor triatriatum with ultrasonocardiotomogram and conventional echocardiogram A74-38125

SAKELLARIS, P. C.
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen A74-38915

SALDIVAR, J. T., JR.
Physiological responses in air traffic control personnel: Houston Intercontinental Tower
[AD-777838] N74-29465

SALEH, M. A.
Correlation of hippocampal theta rhythm with changes in cutaneous temperature
[NASA-CR-139527] N74-30461

Correlation of the Hippocampal theta rhythm to changes in hypothalamic temperature
[NASA-CR-139526] N74-30462

SALINARI, S.
Simulation by digital computer of walking machine control system A74-39507

SANDHOFER, P.
The influence of a zero-calorie diet on cardiac performance in overweight women with normal circulatory systems
[NASA-TT-F-15711] N74-30469

SANDLER, H.
Cardiac mechanics: Physiological, clinical, and mathematical considerations A74-39626

Angiocardiographic methods for determination of left ventricular geometry and volume A74-39632

Clinical applications of angiocardiography A74-39633

Oxygen utilization of the human left ventricle - An indirect method for its evaluation and clinical considerations A74-39642

SANFORD, D.
Skylab food system laboratory support
[NASA-CR-134380] N74-30490

SANTUCCI, G.
Protocol of examination of a pair of 'anti-dazzle' spectacles intended for aircrew
A74-38505
SASSEVILLE, J.-L.
Continuous recording of multiple parameters during perfusion of human colon
A74-40758
SAUER, R. L.
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
SCHAEFER, S. S.
The dependency of the acceleration response of primary muscle spindle endings on the mechanical properties of the muscle
A74-40903
SCHAPER, W.
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
SCHEVING, L. E.
Circadian variation in presumably heathly young soldiers
[NASA-CR-139234] N74-29452
SCHMID, P. G.
Evidence against the presence of ventricular chemoreceptors activated by hypoxia and hypercapnia
A74-39375
SCHMIDT, E. L.
Fluorescent antibody detection of microorganisms in terrestrial environments
[NASA-CR-139386] N74-30479
SCHMIDT, T. C.
Oxygen toxicity
[AD-779282] N74-29453
SCHUBERT, F. H.
Development of a six-man, self-contained carbon dioxide collection subsystem for spacecraft application
[ASME PAPER 74-ENAS-16] A74-39120
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498
SCHUEMER-KOHRS, A.
Effects of aircraft noise on man
A74-40091
SCHUEMER, R.
Effects of aircraft noise on man
A74-40091
SCHULZ, P.
On the question of pilot deterioration during low altitude flight
[NASA-TT-F-15799] N74-30470
SCHUMACHER, E. A.
Design, fabrication and acceptance testing of a zero gravity whole body shower
[ASME PAPER 74-ENAS-51] A74-39144
SCULLY, M. O.
Role of gravity in preparative electrophoresis
N74-29914
SEBASTIAN, J. D.
A user-oriented program for crash dynamics
A74-39782
SEMESHINA, T. M.
Nucleic acid content in the neuron-neuroglia system of the supraoptic nucleus of the hypothalamus of hibernating Siberian marmots
A74-40899
SHARON, E.
Treatment of systemic lupus erythematosus with azathioprine
[NASA-TT-F-15840] N74-30473
SHAWALOK, P. D.
The histopathology of chorioretinal lesions produced by the gallium arsenide laser
[AD-778736] N74-29455
SHERIDAN, T. B.
The multi-moded remote manipulator system
A74-39510
SHIELDS, N. L.
Manipulator system-man-machine interface evaluation program
[NASA-CR-120218] N74-29459
SHIFFRIN, R. M.
Can attention be allocated to sensory modalities
A74-40129
SHIH, H. S. T.
Role of gravity in preparative electrophoresis
N74-29914
SHILLINGFORD, J. P.
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463
SHINNERS, S. M.
Modeling of human operator performance utilizing time series analysis
A74-40022
SHUMAR, J. W.
Six-man, self-contained carbon dioxide concentrator subsystem for Space Station Prototype (SSP) application
[NASA-CR-114742] N74-30498
SIEKER, H. O.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
SILAGE, D. A.
Estimation of phasic intra-ventricular volume by electromagnetic induction
A74-39208
SIMAAN, J.
Left ventricular volume as a determinant of myocardial oxygen consumption
A74-40465
SIMMONS, G. M.
Carbon wastewater treatment process
[ASME PAPER 74-ENAS-46] A74-39141
SINIFF, D. B.
Remote sensing of Antarctic biological resources - Vertebrates
A74-39279
SKELTON, C. L.
Myocardial energetics
A74-39631
SLONIM, A. D.
Ecological physiology of animals
[NASA-TT-F-14203] N74-30464
SMIRNOV, K. A.
Localization and properties of reticulo-spinal neurons with axons descending in the dorsolateral parts of the lateral funiculi of the spinal cord
A74-38344
SMITH, A. H.
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765
SMOLKA, A. J. K.
Role of gravity in preparative electrophoresis
N74-29914
SNYDER, R. S.
Role of gravity in preparative electrophoresis
N74-29914
SOELL, M.
The determination of stress and fatigue, taking into account the example of air traffic controllers
A74-40334
SOLOVYEV, V. S.
Construction of a mathematical model of the human body, taking the nonlinear rigidity of the spine into account
N74-29799
SONG, S. H.
Effect of anesthesia on rate of N2 washout from body stores
A74-40757
SONNENBLICK, E. H.
Myocardial energetics
A74-39631
SOPHER, I. M.
Myocarditis and the aircraft accident
A74-40283
SPARVIERI, F.
Psychodiagnostic behavior during the Zulliger collective test of a group of subjects belonging to the black race compared with that of a similar group belonging to the white race
A74-40441
STAR, L. D.
Operation S.A.F.E. /Simulated Aircraft Fire and Emergency/
A74-39800

STARR, T. J.
The degradation of oil in continuous culture
[AD-780234] N74-30485
STEPHENS, S. D. G.
The effect of intensity on the localization of different acoustical stimuli in the vertical plane
A74-38472
SUMNER, J. S.
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis
[PAPER-E11] N74-30813
SUN, S. S.
A theoretical study of gaits for legged locomotion systems
N74-30455
SUVOROV, P. M.
Predicting resistance to G-forces by the aid of a decompression functional test
[NASA-TT-F-15823] N74-30471
SWAN, H. J. C.
A conceptual model of myocardial infarction and cardiogenic shock
A74-39638
SWANSTON, M. T.
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves
A74-38088

T

TAEUBER, H.
The ocular dipole - A damped oscillator stimulated by the speed of change in illumination
A74-38083
TAKEYASU, K.
Precise insert operation by tactile controlled robot
A74-40116
TAMURA, H.
Modes of control and the limits of control capability for human subjects
A74-40024
TAYLOR, G. R.
Recovery of medically important microorganisms from Apollo astronauts
A74-39792
THACKRAY, R. I.
Photographic analysis of human startle reaction to sonic booms
A74-39789
THOMAS, M.
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
THOMPSON, C. D.
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
THORNTON, W. A.
Conference on Industrial Robot Technology, 2nd, University of Birmingham, Birmingham, England, March 27-29, 1974, Proceedings
A74-40114
TIMBAL, J.
Evaluation of the thermal debt starting from body temperatures during immersions in cold water
A74-38501
TIMOGIANNAKIS, G.
ST segment deviation and regional myocardial blood flow during experimental partial coronary artery occlusion
A74-40462
TITTERINGTON, W. A.
Development status of solid polymer electrolyte water electrolysis for manned spacecraft life support systems
[ASME PAPER 74-ENAS-2] A74-39115
TIZUL, A. Y.
The significance of cumulative coriolis acceleration for tests for expert medical selection
[NASA-TT-F-15824] N74-29448
TOCHER, J. L.
A user-oriented program for crash dynamics
A74-39782
TOLKMITT, F. J.
Latency of sound localization as a function of azimuth and frequency
A74-40168
TONNELAT, J.
The energy aspect of the mechanism of enzyme action
[NASA-TT-F-15835] N74-30465
TOOCHSTONE, R. M.
Photographic analysis of human startle reaction to sonic booms
A74-39789
TOWILL, D. R.
A transfer function approach to human operator skill development
A74-39505
TRISTANI, F. E.
Coronary artery occlusion and blood lipids
A74-38122
TWIGG, D. W.
A user-oriented program for crash dynamics
A74-39782
TYLER, C. W.
Induced stereomovement
A74-38080

U

UHLARIK, J. J.
Fragmentation and identifiability of repeatedly presented brief visual stimuli
A74-40131
ULTMAN, J. S.
Simultaneous gas flow and diffusion in a symmetric airway system - A mathematical model
A74-40766

V

VACCA, C.
Observations of the embryonal rat pancreas during chronic hypoxia
A74-40439
VANOSS, C. J.
Preparative electrophoresis of living lymphocytes
N74-29915
VARNEY, J. R.
An evaluation of the use of ERTS-1 satellite imagery for grizzly bear habitat analysis
[PAPER-E11] N74-30813
VARTANIAN, I. A.
Reaction of central auditory neurons to signals with different directions of frequency modulation
A74-38343
VARTBARONOV, N. A.
Predicting resistance to G-forces by the aid of a decompression functional test
[NASA-TT-F-15823] N74-30471
VATNER, S. F.
Telemetry of left ventricular diameter and pressure measurements from unrestrained animals
A74-40762
VENSLAUSKAS, M. I.
Characteristics of electrotonic propagation along the dendritic tree of retinal ganglion cells
A74-38345
VERNIKOS-DANELLIS, J.
Alteration of pituitary-adrenal dynamics induced by a water deprivation regimen
A74-38915
VERTUT, J.
VIRGULE - A rescue vehicle of the new teleoperator generation
A74-40118
VETTES, B.
Action of low frequency vibrations on cardiac quickness and variability
A74-38503
VICENTINI, V.
Visual range of an object in the atmosphere
[BLL-DRIC-TRANS-3318-(3623.66)] N74-30487
VIERCK, C. J., JR.
Tactile movement detection and discrimination following dorsal column lesions in monkeys
A74-39251
VIGNAENDRA, V.
Positive occipital sharp transients of sleep - Relationships to nocturnal sleep cycle in man
A74-40448

VINCENT, J. D.
Firing patterns of hypothalamic supraoptic neurons during water deprivation in monkeys
A74-38600
VINNIKOV, Y. A.
Evolution of the gravireceptor and its investigation under conditions of acceleration and weightlessness
[NASA-TT-F-15574] N74-30467
VOLOSHIN, V. G.
Predicting resistance to G-forces by the aid of a decompression functional test
[NASA-TT-F-15823] N74-30471
VON HOFSTEN, C.
Proximal velocity change as a determinant of space perception
A74-40130
VON ROSENBERG, D. U.
The effects of caudocephalad /+Gz/ acceleration on the initially curved human spine
A74-38290
VUKOBRATOVIC, M.
Legged locomotion robots - Mathematical models, control algorithms and realizations
A74-39465

W

WACHTEL, T. L.
Use of the pig as a bioassay substrate for evaluation of thermal protective clothing and physical sensor calibration
A74-40279
WALKER, J. A.
Coronary artery occlusion and blood lipids
A74-38122
WALTERS, D. E.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
WANGENSTEEN, O. D.
Respiratory gas exchange of high altitude adapted chick embryos
A74-40765
WARE, C.
On interocular transfer of various visual aftereffects in normal and stereoblind observers
A74-38089
The spatial selectivity of the tilt aftereffect
A74-38090
WEBB, J. A., JR.
A description of model 3B of the multipurpose ventricular actuating system
[NASA-TM-X-71570] N74-29462
WEGMANN, H. M.
The catecholamine and 17-hydroxycorticoidexcretion of five aquanauts during their stay in the underwaterlaboratory Tektite 2
[DLR-FB-74-02] N74-30482
WEINSTEIN, G. B.
Stability of the intracranial circulation in an altered gravitational field
A74-39796
WEISSE, A. B.
A comparison of thermodilution coronary sinus blood flows and krypton myocardial blood flows in the intact dog
A74-40464
WERTHAMER, S.
Pulmonary lesions induced by chronic exposure to ozone. I - Biochemical alterations
A74-40893
WESTOVER, J. B.
The potable water system in Skylab
[ASME PAPER 74-ENAS-17] A74-39121
WHEELER, M.
Extent of myocardial flow from luminal collateral circulation
A74-40763
WHITNEY, D. E.
The multi-moded remote manipulator system
A74-39510
WHITTLE, P.
Luminance discrimination of separated flashes - The effect of background luminance and the shapes of T.V.I. curves
A74-38088
WILBOURN, J. M.
Feasibility of using special measures in the classification and assignment of lower mental ability airmen
[AD-777831] N74-29467
WILLIS, N. C.
The Representative Shuttle Environmental Control System
[ASME PAPER 74-ENAS-52] A74-39145
WILSON, J. B.
Computer analysis of ultrasoundcardiograms
A74-38289
WITHERSPOON, G. F.
An evaluation of Orbital Workshop passive thermal control surfaces
[ASME PAPER 74-ENAS-39] A74-39136
WITTE, L. C.
Characterization of heat transfer in nutrient materials, part 1
[NASA-CR-134382] N74-30499
Characterization of heat transfer in nutrient materials, part 2
[NASA-CR-134383] N74-30500
WOLFE, R. R.
Role of hematocrit and blood volume on hypoxia tolerance in the sea level- and altitude-adapted rat
A74-39791
WOLTHUIS, R. A.
Apollo space crew cardiovascular evaluations
A74-39790
WONG, A. Y. K.
Application of Huxley's sliding-filament theory to the mechanics of normal and hypertrophied cardiac muscle
A74-39640
WOO, G. C. S.
Temporal tolerance of the foveal size of Panum's area
A74-38082
WOOD, E. H.
Algebraic reconstruction of spatial distributions of acoustic absorption within tissue from their two-dimensional acoustic projections
A74-39821
Intrathoracic and venous pressure relationships during responses to changes in body position
A74-40755
WOODIN, A. E.
The multi-moded remote manipulator system
A74-39510
WORK, E. A., JR.
Utility of ERTS for monitoring the breeding habitat of migratory waterfowl
[PAPER-E12] N74-30814
WUESTEN, B.
The distribution of coronary and of coronary collateral flow in normal hearts and after chronic coronary occlusion
A74-38237
WYNVEEN, R. A.
An automated water iodinating subsystem for manned space flight
[ASME PAPER 74-ENAS-54] A74-39147

Y

YAKOVLEVA, I. Y.
The significance of cumulative coriolis acceleration for tests for expert medical selection
[NASA-TT-F-15824] N74-29448
YARTEZ, P.
Postmortem myocardial tissue lactate and potassium levels in fatal aircraft accidents
A74-40285
YEGOROV, A.
How space medicine helps terrestrial
[BLL-M-23364-(5828.4F)] N74-30456
YON, E. T.
Microelectronic bioinstrumentation system
[NASA-CR-139216] N74-29463
YOSHIDA, T.
Modes of control and the limits of control capability for human subjects
A74-40024

Z

ZACHAROULIS, A. A.
Estimation of stroke volume from the pulmonary artery pressure record
A74-40463

ZADOKS, J. C.
Biology and remote sensing from spacecraft
A74-39277

ZARDI, O.
A study of the Au antigen and anti-Au antibodies as a deductive test of hepatocellular alterations in clinically healthy subjects
A74-40438

ZAZHIVIKHINA, A. I.
The use of a digital computer for investigation of the dynamic characteristics of a man while pressing vertically downward with the straight arm on the handle of a vibrator (instrument)
N74-29811

ZELIKSON, B. B.
Stability of the intracranial circulation in an altered gravitational field
A74-39796

ZHELEZNOV, N.
Life in weightlessness biological laboratories in orbit
[NASA-TT-F-15851] N74-29447

ZUKEL, W. J.
Epidemiology of coronary heart disease among young Army males of World War II
A74-38123

ZVONAREV, G. P.
Limits of normal fluctuations of the basic hemodynamic indices in young men
A74-40799